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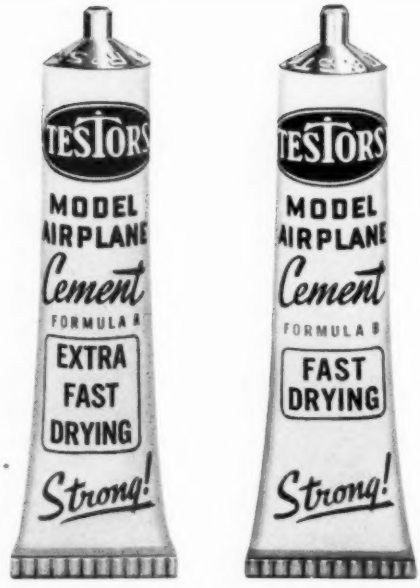

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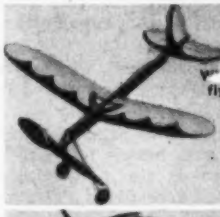

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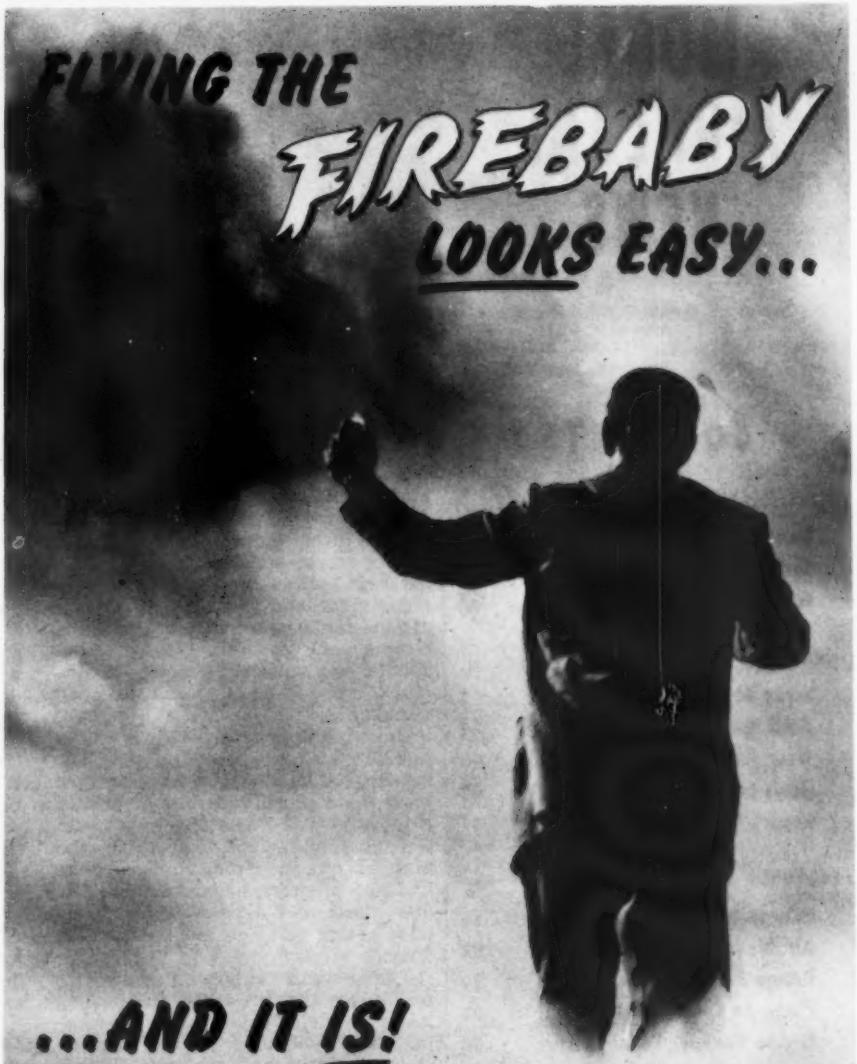

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Being a model builder this balsa butcher is not afraid to admit how long he has been building. All modelers are ageless. You take a guy like C. O. Wright whose son, Bob, runs a cyclotron or tetrahedron or some such atomic jaw breaker (and tries to keep up with the old man!), and you find he has been launching free flights, rubber or gas, since before 1920. Then there is Charlie Grant, who never looks a day older, and you can find pictures of him in old issues of MAN drooping from a hang glider in 1910 or thereabouts. Mix such old timers with the latest crop of juniors and they all sound alike.

But what does get us is the way you have to sprint to keep up with the parade. For 24 years we have scraped hard wood props with bits of broken china, stuck on household tissue with orange shellac, and discovered the marvels of cement and dope, engines and fuel proofers, banana oil and *Sta*, flour paste and *Aero Gloss*. Now the pace grows fast—or are we slowing down?

The new rules approve a single wire for speed; the hot-shots are putting gears in their Wakefields with fuselages the world over growing to monstrous lengths—as much as 5'; Walker threatens ships that can roll in stunt; the beep box is making radio jobs do chandelles, Immelmans, lazy eights, and so on, all on rudder only; cargo clippers have arrived and, on pages 14-15, Williamson talks about payload controline. That noise you hear is not a jet job diving, but a sigh of despair. Pressure tanks, balloon tanks, dethermalizers, tensioners, flaps, slots, pulse rate control, displacement, pulse jets, gears, Jetex, plasticizing, side thrust, laminar flow, slow motion props.

Things have become so complicated that you can't tell a beginner from an expert. Even the experts look bad when they get out of their specialty—for you sure do have to specialize to look good! Nobody knows all the answers. Two decades ago the only answer that counted was, "It flies!" It's fun when you don't care how it flies, but it's a chore as soon as you try to make it fly better . . . and better . . . and better. Where are we going? Let's look into the crystal ball. Fasten that safety belt—the shoulder harness, too.

Free flight: As Frank Zaic points out so eloquently in this issue, there's a mighty big difference in trim, between power on, when air-speed is high, and power off, when air-speed is as slow as you can get it without spinning in. How about variable area? We recall one modeler who hinged his panels half way to the tip, folding the outer sections under the center of the wing, until the motor cut. Then the folded section flicked into position. Perhaps some juicy Fowler flaps could be run out by means of a timer release after 25 sec. This calls for painstaking construction. You could use a fairly small wing for hot climb; then, after the dipsy doodle at the top, out would pop those barndoor flaps, probably at a slight angle to increase camber. You could jump the area by 25, even 50%. Who knows the future? The 2013 Nationals may be taken by a free flight with insect-like antennas on each wing tip for thermal sniffing. Funny, you say. They have had gadgets like that for sailplanes for years. Might be hooked to the rudder for steering, too. And did you know that the Dutch long ago fooled with a compass tie-in with rudder for towliners? And why treat Jetex as a novelty?

This is the age of jet propulsion. It seems ironic that we have such resistance to jets in free flight. We refer to the Jetex power-plant only. Now the new rules have knocked out CO-2, which briefly served its place. The Scrap Box does not recommend special events for Jetex but why in the name of a ball bearing bellcrank, can't we permit Jetex to compete directly with gas in free flight. Granted that a *Torp, Veco, McCoy*, etc., would make a Jetex look mighty sick — we think — but, aren't we the guys who yell about stifling progress? If the experimenter wanted to compete the hard way, for the sake of being different, why not let him? He would come up with some interesting answers eventually.

Brother, if you think that 350 Jetex is sissy stuff, you better go back to slicing inner tubes for your rubber job. The present free flight rules say nothing about area. The Jetex designer would make a compact machine and would get it up to enormous heights. You've heard about thermals, yes? A light machine would glide well enough to be a threat. Maybe those Fowler flaps would be an answer here. Jetex does not have a long motor run, either. Offhand, (*Continued on page 5*)

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SCRAP BOX

(*Continued from page* 2)

we can't say what the "displacement" is. There may be a comparable yardstick. The little Jetex would be a good foe for the AA engine. This is not a plug for Jetex, believe us. The jets are here in aviation, big or little.

Stunt: Jim, break down. What is that single line deal with a machine that can roll? Consider what this does to the pattern. Level flight, rightside up and inverted. How about a half lap right side up, with the second half inverted, and vice versa. You could roll at the midpoint of a vertical eight, for example, and keep your wheels inside, or outside, at all points. Make it tough! Okeh, how about a hesitation roll, that showpiece of real air shows. You stop your roll briefly every 45°, hold it briefly, then go on to the next position, making eight precise stops in a roll. Slow rolls and fast rolls. Immelmans. There's no end of possibilities.

Knowing comparatively little about stunt we rush in where angels fear to tread. Take a thing like dihedral. Does it help? Most guys say nix. We wonder. One thing stunt jobs lack in critical quantities is lateral stability. That's one reason why they come in at you at the drop of a hat; an added reason for weighted tips, off center wings, offset thrust, and other cute tricks. Did you ever see Madman Yates steering a *Madman* in overhead eights in a wind. The thing almost seemed to free flight. He used some dihedral. The retort is, "Yeh, and what happens when you get on your back?" It didn't bother Yates.

Another time we watched Cal Smith flying a Bantam *Nieuport 17* in the wind. The lines were bowed at times, and the ship seemed to assume a correct angle of bank, circular flight, if you will. It had very little tendency to come in and seemed to fly in a groove. Now consider this. How about a biplane, with dihedral in the top wing and cathedral in the bottom wing. Right side up or on its back, it would all be the same. Yet this machine would have lateral stability, which would help the high maneuvers, and make them look like something. Not like those flat maneuvers performed by the flying planks. Wing loading would be less, so you could make a smaller ship for the same job. Flaps could be placed on both wings, connecting the second set of flaps to the first by means of a strut. Like the ailerons on top and lower wings of a real biplane.

Engines: And when is someone going to perfect a turbine? How about that Duromatic, K & B, Dooling? Some of you guys have made experimental engines that turned up to 60,000. The first one to market a workable turbine can retire early enough to enjoy life. You should be able to make a turbine that won't melt! Then we'll have turbojets, and turboprops with a jet effect thrown in. Eventually, we'll have turbines. Why not now? A turboprop would have oodles of thrust. Maybe we'd better design some rules before the engineers sink their teeth in this one. Matter of fact, what harm is there in planning ahead. We have .02's, .049's, .074's, .065's, .09's, .035's now in baby engines as manufacturers try to guess the future classes. Wonder how big the first turbine would have to be. Probably would sound like a vacuum cleaner.

Rubber: Why only two geared motors? Back in the twenties the old Country Club Model Aeroplane Co. made a remarkable kit called the *Flying Fool*. It had three parallel rubber motors with a set of gears at each end of the fuselage. Construction, incidentally, involved formers and two balsa shells to cover the fuselage. These were formed. That airplane was a five footer, if memory serves. The motor, or rather the prop, ran forever and a day. Move over Ellila! So it is windy. Take out the removable gear supporting posts and hook one big motor in place.

At the rate we are going, automatic pitch-changing props are just around the corner. In England, Bob Copeland and Evans have used such props with success. Evans' prop has made him runner up to (*Continued on page* 46)

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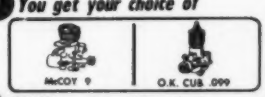

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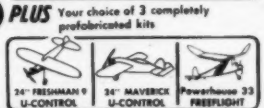

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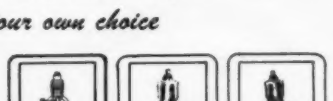

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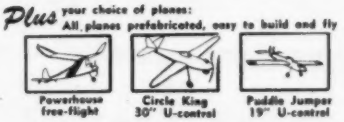

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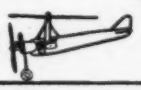

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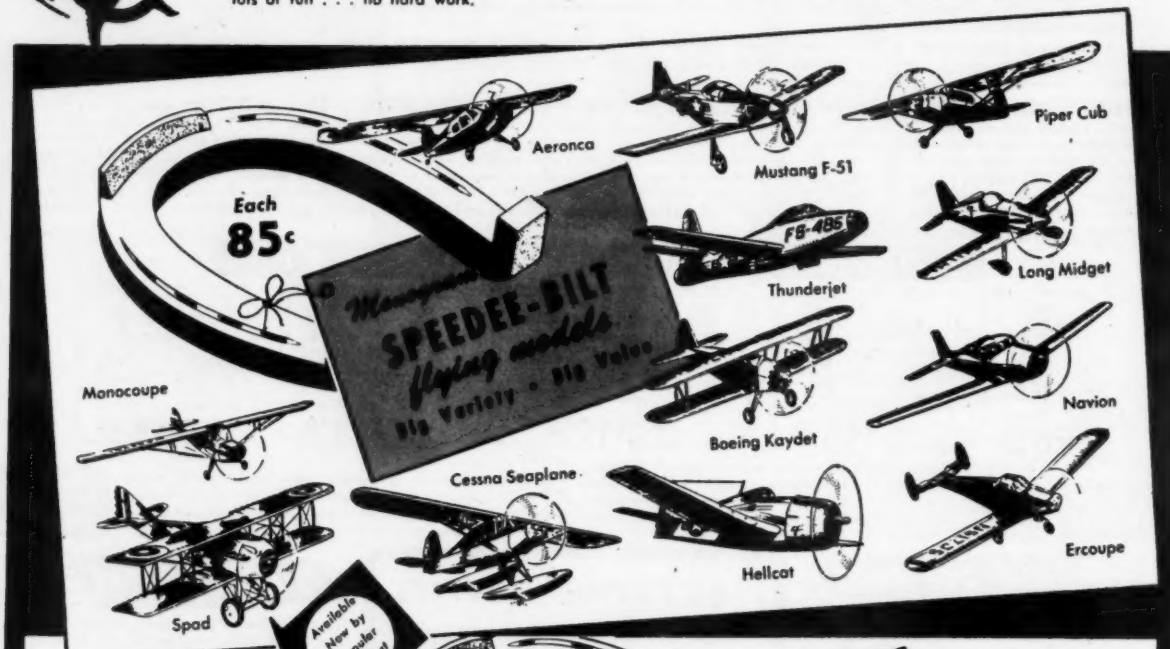

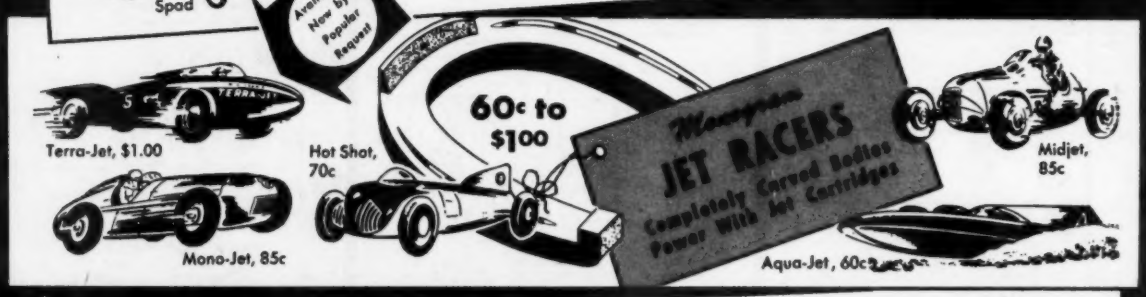

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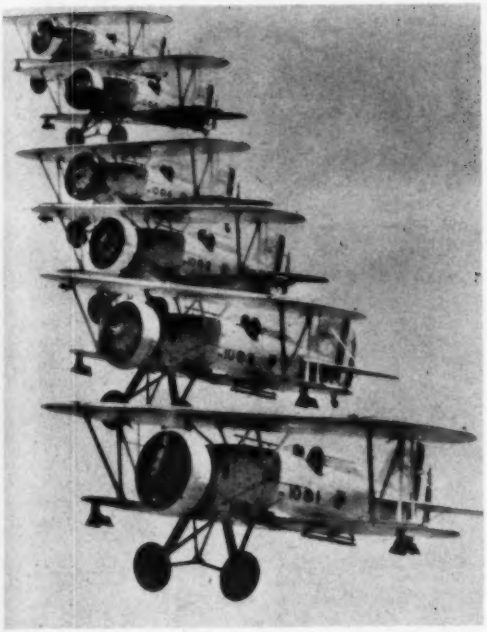

Close formation of Marine Corps Boeings. Made for Army, Navy, and Marines, the stubby Boeing was a great fighter.

The ring type cowl effectively hides even a .29. Thicker stunt wing section is the only variation from scale. Note the corrugated tail surface, tank filler cap, arresting hook!

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One of the all-time greats, the Boeing fighter F4B-4 makes a perfect project for the flying scale stunt fan. This is the first of two installments.

by WALTER MUSCIANO

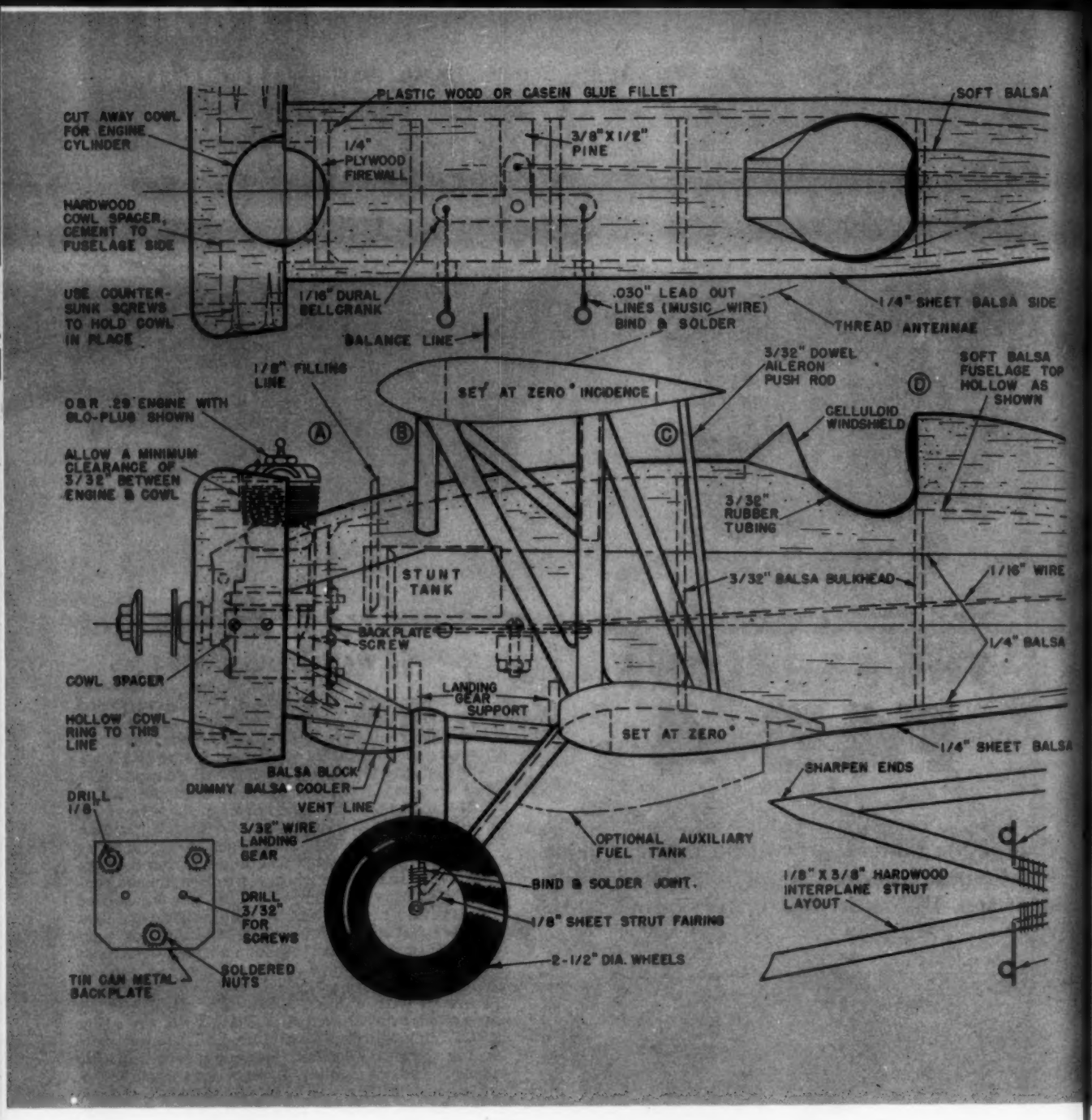
The author attaches booster clips before starting Ohlsson .29 original F4B-4.

Whether you are a stunt man or a scale beauty fiend or just content with a colorful ship that handles like a dream, this one inch to the foot scale replica of one of the most famous fighters of all time is sure to please.

Although the glamorous Boeing F4B (Army P-12) series never saw action in defense of the United States, the 554 airplanes that were built for the Army and Navy formed our first line of aerial defense during the years 1930 to 1935. The F4B-4 was the latest Navy modification of this design and differed from the previous F4B-3 in that the wings were strengthened considerably for dive bombing and a life raft was stowed in the enormous yet distinctive head rest. Fin area was increased and squadron identification lights for night flying and removable engine mounts were fitted. These neat little biplanes were considered the finest fighters of their time.

Powered with a Pratt & Whitney Wasp R-1340D nine-cylinder radial engine of 500 hp, the top speed was 187 mph and the F4B-4 cruised at 160 mph while landing speed was 61 mph. Maximum range was 585 mi. on 110 gal. of gasoline. Gross weight was 2,898 lb. and absolute ceiling was 29,000'. Armament consisted of one 30 and one 50 calibre machine gun firing forward through the propeller arc. As a dive bomber one 116 lb. bomb could be fitted under each lower wing. A two-bladed, adjustable pitch Hamilton Standard propeller was used on all planes of this series. A total of 21 Boeing F4B-4 shipboard fighters was delivered to the Marine Corps, while 71 were used by the U. S. Navy. An additional 14 of these famous fighters were purchased by the Brazilian government. The wings utilized a framework of wood with fabric covering and the fuselage was all metal with truss and monocoque construction. Empennage consisted of corrugated dural sheets over a metal framework. Despite the fact that these pert little fighters never saw action, much was learned from them that enabled the Army and Navy and airplane manufacturers to develop the efficiency of design and operation of our present day combat planes.

In order to provide a most complete article to enable



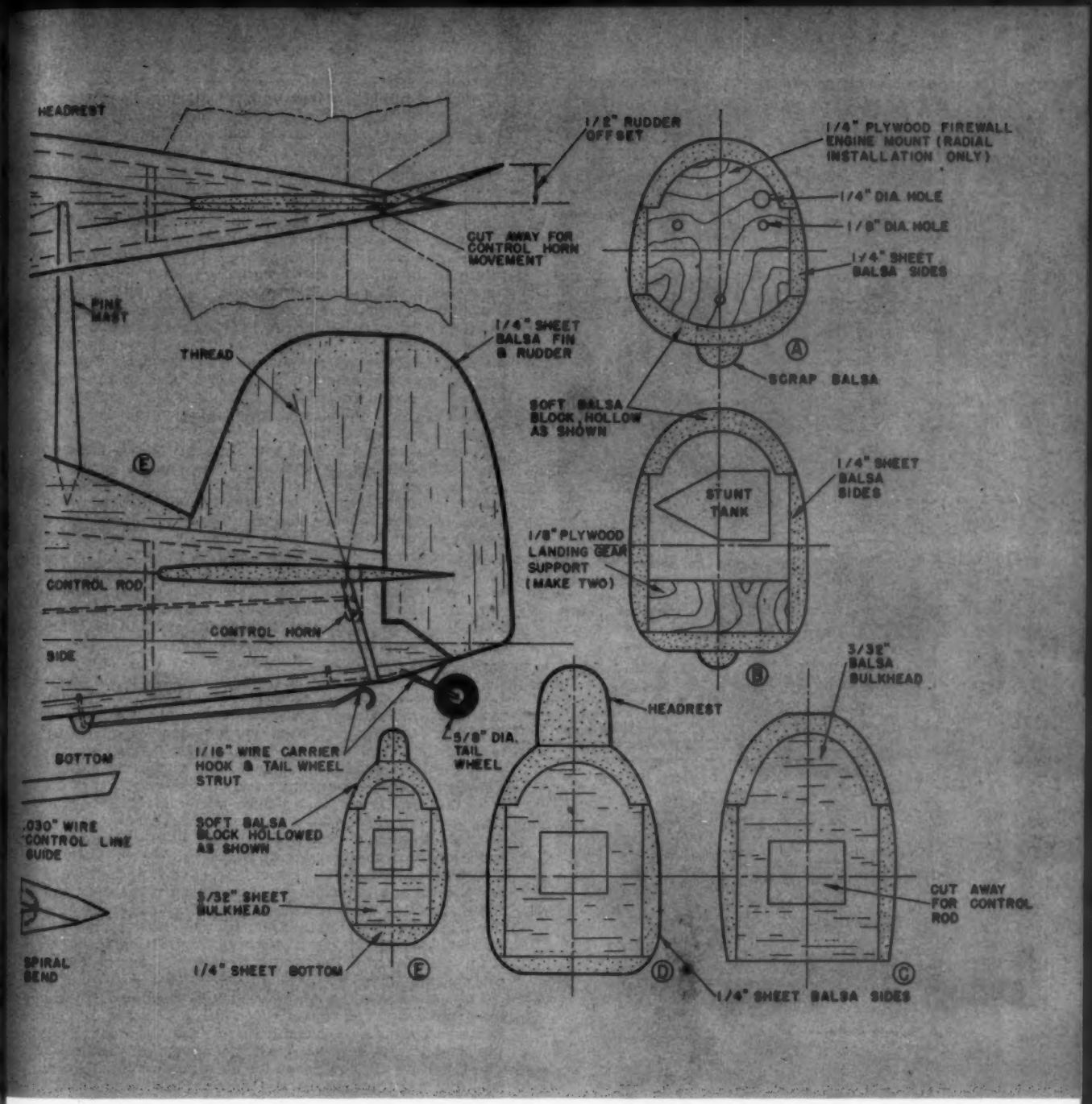
you to build this model with the least amount of effort, the plans are presented in two installments. Although the experienced builder may begin construction of this 230 sq. in. wing area model at once, we suggest that the novice wait until he has the complete article and can read it through a few times before beginning construction.

The Army Boeing P-12E is equally as famous and the slight differences from the F4B-4 are indicated on the plans; 110 of these planes were delivered to the U. S. Army, and it is the most popular of the P-12 series. Both the F4B-4 and P-12E were used by crack squadrons.

We wish to express our sincere appreciation to Mr. Gordon S. Williams of the Boeing Airplane Company for supplying much valuable material which greatly contributed to the success of this article.

Our prototype model was built for both stunting and scale beauty purposes and although we used an Ohlsson .29 any engine of equal displacement can be used successfully. As a matter of fact a very powerful .19 should handle a light model well for sport while a .49 will provide plenty of zip for those who desire it. Note that the plans illustrate both beam and radial type of engine mounting as well as an alternate McCoy installation. Do not let plan enlarging stop you because construction drawings have been presented one half actual size. Therefore all you have to do is double any measurement in the magazine plan to obtain a full size model.

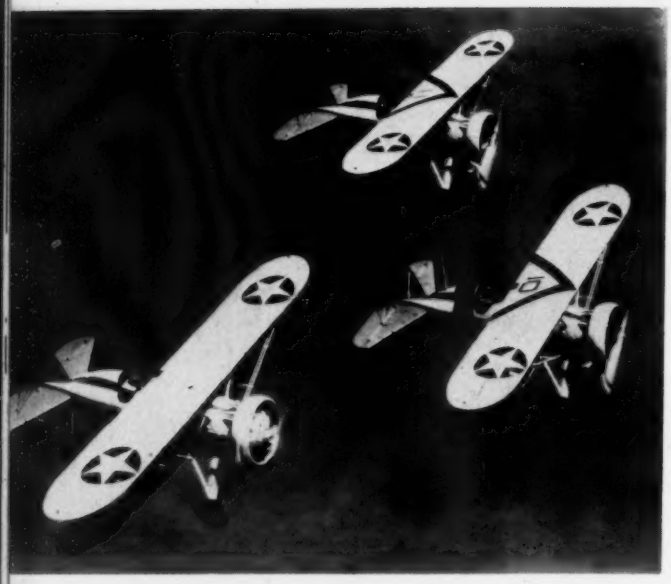
In view of the very shallow curve on the fuselage side

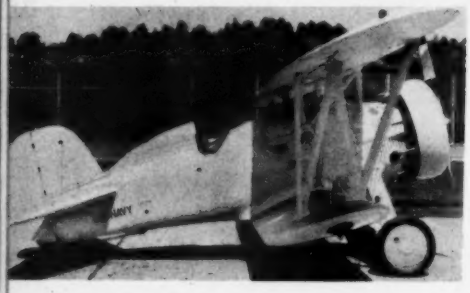


section, we were able to utilize 1/4" sheet balsa for the basic side panels and these are cut at this time being certain that portions are cut away for the lower wing and stabilizer. All bulkheads should be cut out now. Bevel the rear edge of the fuselage sides and cement them together and install bulkhead E. When dry add the remaining bulkheads and firewall. Bend the landing gear struts and bind all joints with milk bottle cap wire, and solder well. The landing gear is attached by strapping it to the plywood landing gear supports with layers of crinoline and cement. Attach securely.

Cut the entire empennage from 1/4" sheet balsa and cut and sand to a streamline shape. Cement the elevator halves to the dowel joiner and add the control horn. A standard commercial horn is recommended but be sure to decide whether you intend to stunt or not. The shorter the horn the more sensitive the plane will be to your control movements. Hinge the stabilizer to the elevators by using pieces of crinoline as hinges. Select a commercial bellcrank with proportions similar to that which is shown on the plans. Attach the wire lead out lines to the bellcrank and bolt the bellcrank to the hardwood mount. Cement the bellcrank assembly securely to the fuselage after passing the lead out lines through the two holes in the fuselage side. Connect the control rod to the control horn and bellcrank and then cement the stabilizer to the fuselage. Test

▲ DRAWINGS CONTINUED ON PG. 13

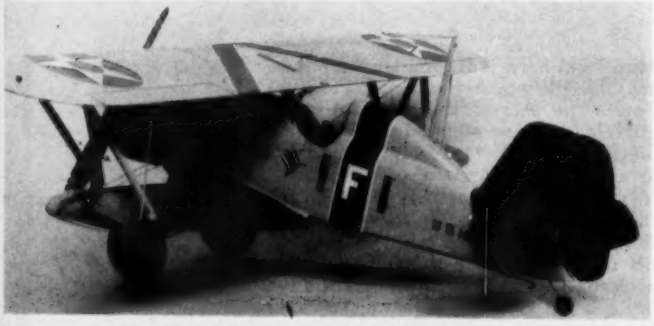




Above — A flight of F4B-4's. In those days it took two wings on a fighter.

Left — Famous profile shows to advantage in this factory pic. Top speed 187.

Gay colors of the famed High Hat Squadron decorate the model. Part 2 will show comprehensive color schemes of all three fighting services.



Despite good looks, model features an easy-to-build fuselage, a minimum of blocks.

the control system.

Cover the fuselage bottom with 1/4" sheet and cut out the blocks for the top and nose. These blocks should only be spot cemented in place, carved and sanded to shape, and then removed and hollowed as shown. If a radially mounted engine is to be used, then fabricate the metal backplate and solder the nuts to it in their proper location. Screw this backplate to the rear of the firewall after the mounting bolt holes have been drilled into the firewall. Add the stunt fuel tank at this time being certain that the suction line is at the same height as the engine needle valve. Add plastic tubing to the filling and overflow lines to terminate these lines outside of the fuselage contour. Replace the fuselage nose and top blocks using plenty of cement this time. Sand fuselage lightly and add the fin. Carve the headrest from a soft balsa block and cement in place. The oil cooler is also made from soft balsa and installed at this time. Cut the landing gear fairing struts from hard balsa or pine and shape to a streamline section. These are held to the wire landing gear by cementing and wrapping with Silkspan or tissue.

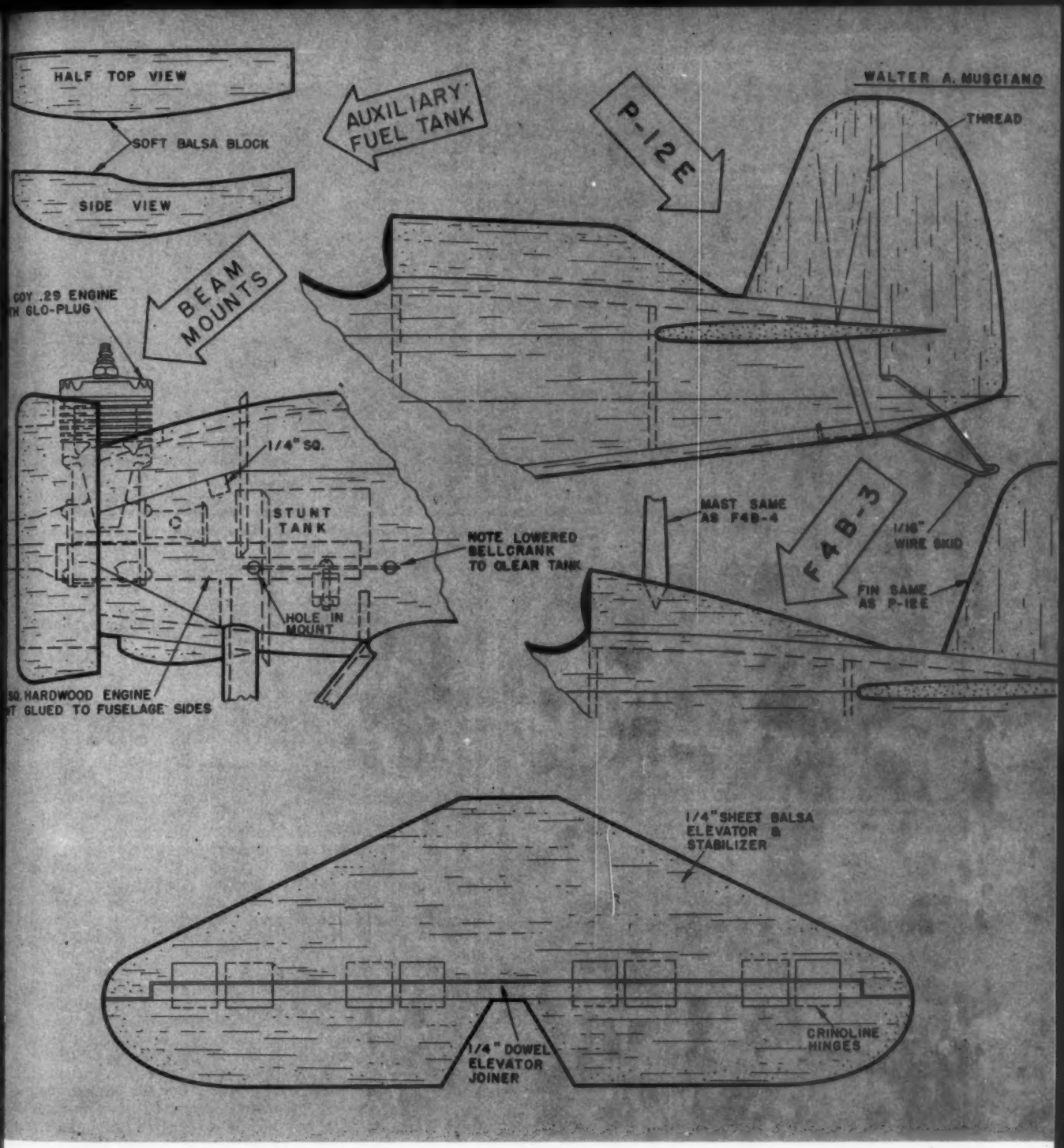
It seems that many model builders will tackle some of the most complex designs; triplanes, quads or boom pushers, and yet they avoid any model that has a Townsend or N.A.C.A. type of drag ring. We normally turn our radial cowls on a lathe from hardwood such as birch or pine; however realizing that most modelers do not possess this machinery we decided to carve the ring from a solid block of medium hard balsa. This is by far the most difficult manner in which to fabricate this item and yet the complete job only took 42 min. using a pencil compass, coping saw, razor blade and sandpaper, plus taking time out for a coke! Obviously any method that attains the net results can be used but we went about it thusly: Select a medium hard balsa block and scribe the inner and outer circles on its face. Cut out the ring roughly to shape with the coping saw and using rather coarse sandpaper (on a block) sand the exterior to shape. Fasten another piece of sandpaper to a wooden spool (about 1-1/2" dia.) and using this tool sand the inside wall of the cowl with a rotating motion. Finish off with fine sandpaper and cut away the top of the cowl to clear the engine cylinder if necessary. The drag ring is held in place with wood screws and hardwood lugs. Most woodworking shops will turn the job for you for about a dollar and a half using your wood.

The cabane struts are now cut to shape from hardwood and shaped to a streamline section. Sharpen the ends and force them into the fuselage using plenty of cement to hold them in place. The auxiliary belly fuel tank is entirely optional and can be omitted without detracting from the scale appearance of the model. If desired it can be fabricated at this time.

The entire assembly thus far should be coated with at least three applications of wood filler (Testor Sanding Sealer). Up to six coats can be used for a fine finish. Sand the model well between coats with medium sandpaper (3/0), and we are now ready for the wings and final Army or Navy painting, details and flying. These will be discussed next month.

In conclusion we would point out some of its finer qualities. First off she handles like a dream which should be enough for the average flyer but should you be in the market for a beauty event entry, this is it! The pre-war Navy color scheme just can't be matched for attractiveness and the pert and snappy appearance of the neat biplane design should win over any judging committee. While on the subject of color schemes we must be sure to have the correct plane number and color bands on our Navy model. Pre-war Navy squadrons consisted of eighteen planes, six flights of three planes each. Each flight is assigned a color which is carried on the nose. These colors can be either red, white, blue, black, yellow or green. Each flight leader carries the flight color on the top wing in the form of a chevron which is used by the other two units of the flight to align themselves during formation flying.

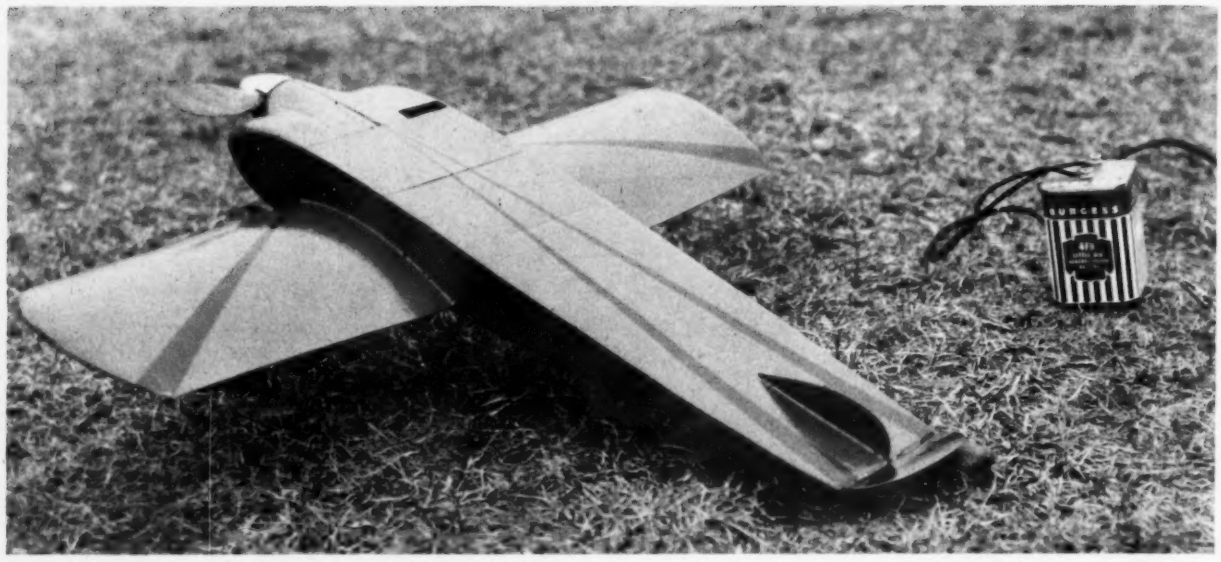
The generous wing area and short moment arm create a very maneuverable model which can perform all stunts.



▶ WALTER MUSCIANO, who has been a contributor to MAN for some years now, began model building 21 years ago. His interest in scale goes back to stories of a glamorous uncle who flew with the German ace, Ernest Udet, and who was lost after 3 victories. At 10, Walter bought 10¢ kits in Miami, sold the assembled product for 50¢. At 12 lost his first free flight.

Now 28 years of age, Walter Musciano was born in New York, now lives in New Jersey. On his own since 12, incessantly built model airplanes and tried to get into aviation. During school, worked at Floyd Bennett Field, washing planes and helping machanics. Learned to fly but never soloed. After getting married, was stymmied by the housing shortage, turned to magazine work. Has had published illustrations in various ship design publications. The Marine Engineers Handbook contains some of his work. More appears in technical transactions of the Society of Naval Architects and Marine Engineers, of which he is a junior member. His elementary plane designs were used by the Boy Scouts.

His first real opportunity came from George G. Sharp, one of the world's leading naval architects, who started him as a junior draftsman. Now works for Malcolm Pirnie, Engineers, designing dams, water systems, etc. Worked on Victory ships, aircraft carriers, Kaiser Aux's, destroyer tenders, etc., during the war. Daughter Carollanne, 4, is interested in planes. Hopes to see her win the Wakefield. Mrs. Musciano isn't talking.



Featuring symmetrical airfoil fuselage this model carries payload of 32 ounces at 70-75 mph on McCoy .29. Gross weight is 15 oz., empty 24.

PAYLOAD COMES TO CONTROLINE

by HARRY WILLIAMSON

***Propwashers Model Airplane Club*, New Jersey, develops a novel event, suggested rules, based on speed attained with maximum load. Here's the story.**

Due to high stresses, control mechanisms should be well made. Construction, while light, must be strong. Built-in cargo container.

▶ Since the advent of the Pan American Airways sponsored, free-flight Payload event several years ago, there has been a recognizable need for a similar event for controline models. Experimentally-minded modelers across the country have, undoubtedly, applied considerable thought and energy to the problem but national interest has not become apparent. In the hope of bridging the gap between the individual experimenter and a workable set of contest rules, we have written this article.

Our objective, in these paragraphs, is not to offer a hard and fast set of rules for a controline payload event. It's our intention to offer it as a chronicle, showing the results of experiments conducted by one model airplane club, in their effort to have inaugurated an event of this type. A simple and flexible set of rules is included in the discussion as a possible nucleus for an officially recognized controline event for future contests throughout the country.

Initial tests began several years ago, by loading-up an old free-flight goat until it pleaded for mercy, but this proved very inconclusive and not at all satisfactory. Obviously, something was lacking, and it became apparent during the early experiments, that any new event should foster a different breed of model. It seemed logical, therefore, that a controline load event should be so conceived as to make a free-flight goat as well as standard types of controline models impractical, if not impossible to use.

In order to achieve this result, it was decided therefore, to combine speed with load lifting. The load, to be of variable weight, at the discretion of the designer but to be carried in a container of required minimum size. This was done to prevent standard speed ships from being utilized and to permit the scoring of this event on the basis of load carried versus speed attained. The only question that remained unanswered was the one concerning landing gear. After a number of tests using take-off dollies and hand-launching, it was concluded that a landing gear of considerable strength was most practical.

The following rules, after careful consideration, were decided upon by the club and have proven to be quite satisfactory and sufficient to date:

Item 1—Model must carry a payload container of at least the required minimum size (see figure 1) totally enclosed in the structure. Item 2—The payload container may or may not be removable, but if not removable it must be accessible for measuring by contest officials. Item 3—The payload must be removable for checking. Item 4—Models must have landing gear. If landing gear is retractable it must lower for landing. Item 5—Model must take off before completing 360° of the flight circle or forfeit 5 points from

the final score. Item 6—Failure of a model to take off on the first attempt will result in an additional 5 point forfeiture. Failure of a model to take off in a second attempt will result in disqualification of the model. Item 7—Scoring will be done by the use of a graph on the basis of speed attained versus load carried, less any points of forfeiture that may be accumulated. Item 8—Timing will begin at a signal from the flyer and continue for 4 laps.

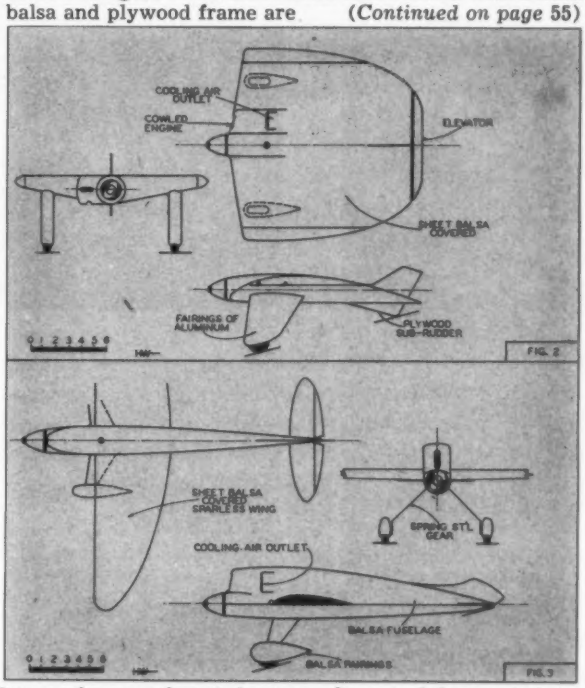
In addition to the above rules, all of the rules governing safe flying of speed models as set forth in current AMA regulations are observed and rigidly adhered to, including line sizes, pull-test requirements, safety straps, line lengths, pylon requirements and so forth.

Designs for this event can be many and diversified. Two examples that show promise are shown in figures 2 and 3 and represent, perhaps, the two extremes—radicalism and conservatism. Figure 2 is reminiscent of the *Flying Pancake* design developed by Chance-Vought Aircraft. This design is representative of the high lift/drag ratio feature so necessary in an event of this type. It also offers a maximum of strength for a minimum of weight—another important consideration in this event. The design in figure 3 is quite similar in many respects to speed designs now prevalent throughout the country, but the additional wing area and landing gear not only suggest a new design but also provide a practical and efficient controline payload model.

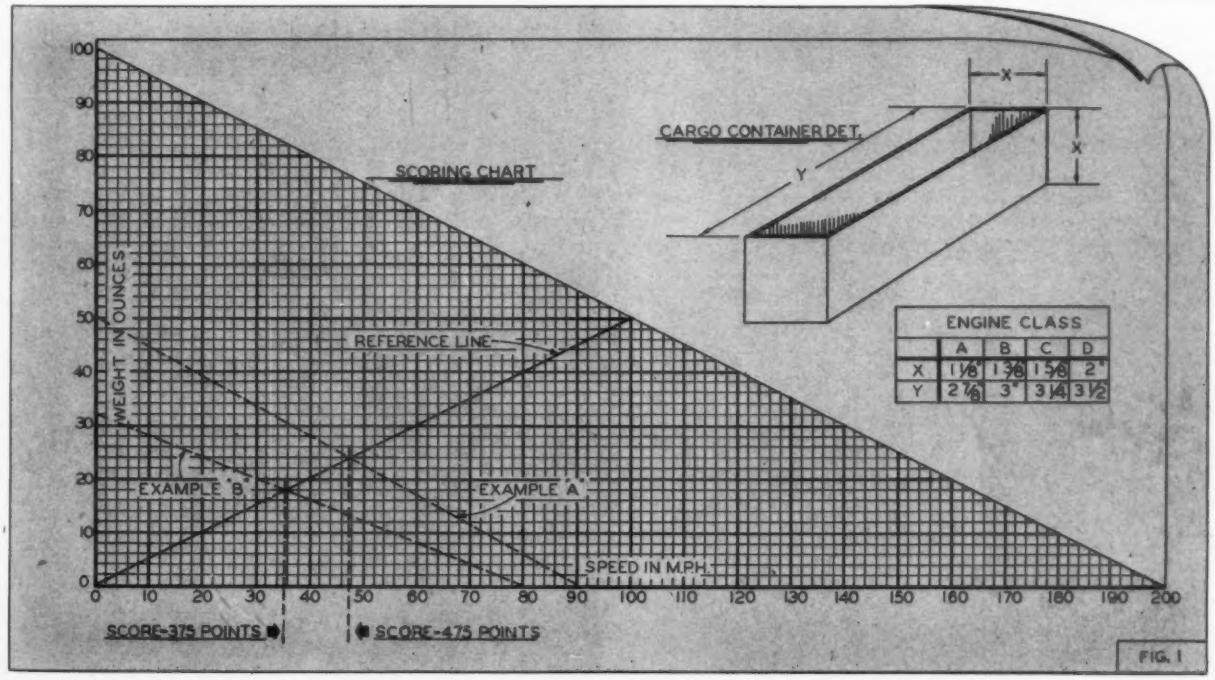
Our club designs at the present time are somewhere between these two extremes, one of which is shown in the photographs. The model pictured is, admittedly, a little freakish but quite practical. The fuselage is a symmetrical airfoil section with trailing edge hinged to function as elevator. The cargo container is built as an integral part of the plywood crutch and located directly on the balance point of the model. This model carries a payload of 32 oz. in addition to its own weight of 24 oz., making a total weight of 56 oz. Quite a load for a McCoy 29, you say! Well, yes it is a load but the speeds to date with this ship are varying between 70 and 75 mph.

In order that this event may produce new and different designs, no restrictions other than landing gear and minimum container sizes have been imposed. For that reason, some of the more unusual configurations that lean toward the high lift side which have been less practical for conventional speed ships may now be utilized with excellent results. Completely cowled engines as exemplified in the present speed designs are both practical and necessary in order that top speeds may be realized.

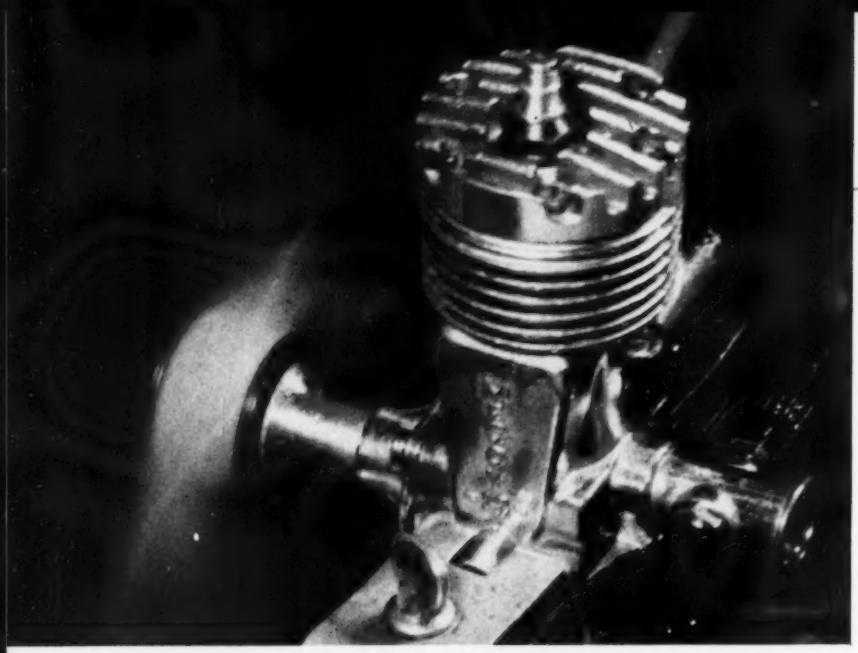
Light and extremely strong construction is a prerequisite. Hard wood speed pans while strong, are extremely heavy and since landing gear is required, they are really not necessary. Carved balsa fuselages with sheet balsa covered wings seem to be most practical for models of the type similar to figure 3. All sheet balsa construction with a hard balsa and plywood frame are (*Continued on page* 55)



Between these two theoretical extremes, lie most of the test airplanes devised by the *Propwashers* MAC. Sturdy landing gear needed.



For convenience of experimenters who may carry basic idea forward, this chart provides quick scoring system, considering speed, weight lifted.



how to break in an engine

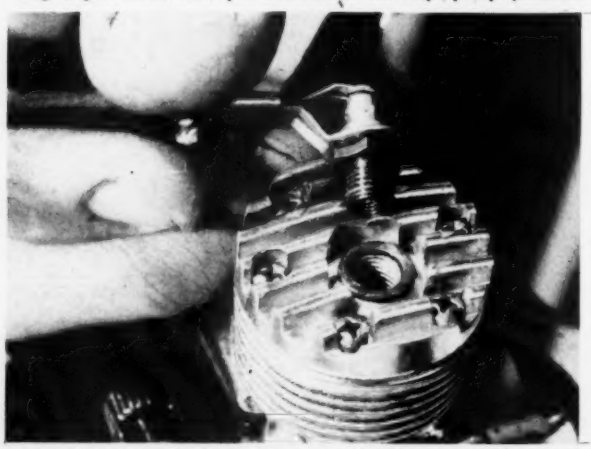
by ARTHUR SILBERBERG

While engine break-in is something to argue about, a poll of free flight and controline experts, a few dealers and manufacturers indicates that careful break-in makes for longer lasting engines and better performance. These pictures show most popular method. Generally speaking, dealers recommend that beginners use at least a half can of fuel, adding castor, running engine rich and slow. When broken in, engine will hold steady rpm when needle valve is leaned to normal.

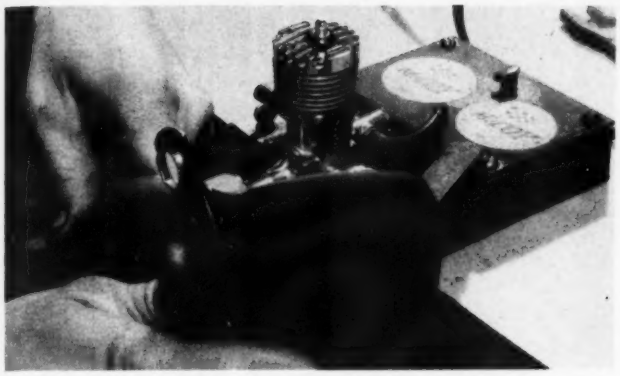
1 Assemble needed items: fuel, squirt gun, prop wrench, prop, booster battery connector. If no test stand, prepare some solid engine mount.

2 Modelers make their own troubles ignoring directions. Before running engine make sure you understand the step-by-step procedure.

3 Some model builders pour medicinal castor oil into squirt guns of fuel. Experts state that it's better to inject castor into running engine.

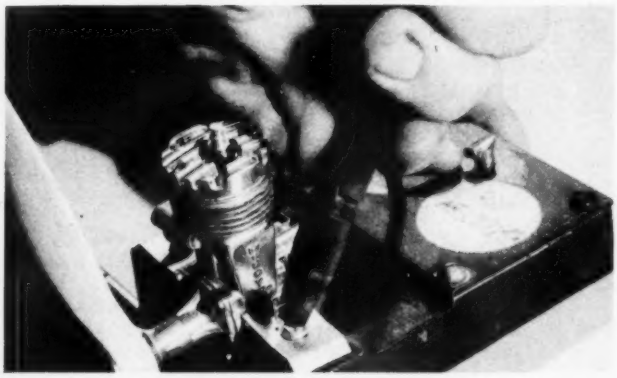


4 Just in case, remove plug, attach booster to see if heating element glows. If using two boosters, be sure of parallel hook-up (1-1/2 V.).

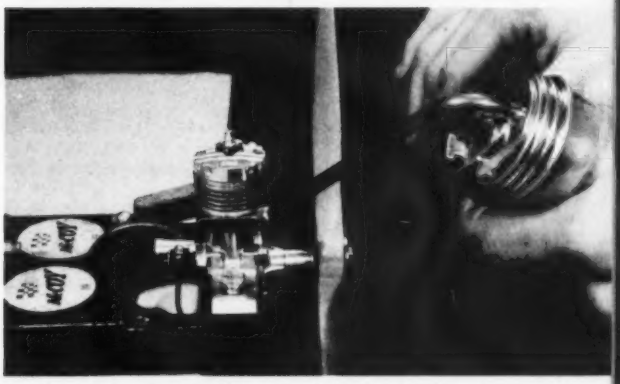


5 Tighten prop nut securely. For easy flipping and starting, set prop against compression in position shown. This will help avoid rapped fingers.

6 You know this trick? By blowing through tubing attached to needle valve body, you can determine exact point of opening. Saves much fussing.

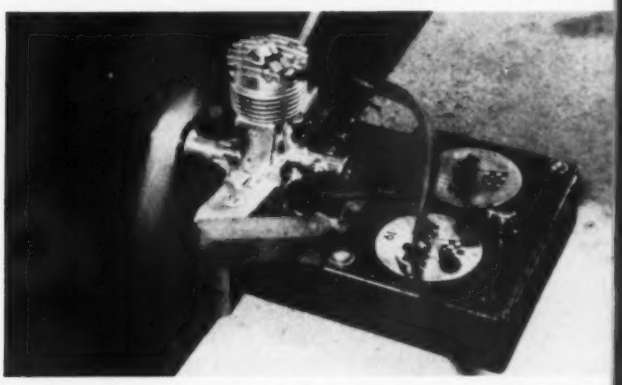


7 If a commercial test mount is used anchor the mount well, make certain of engine fastening. An engine's vibration will undo any loose nuts.

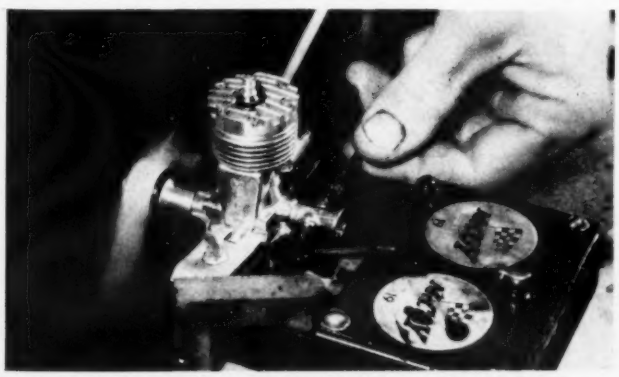


8 Before starting prime with few drops of fuel squirted in exhaust stack. To avoid flooding revolve prop until piston closes the stack opening.

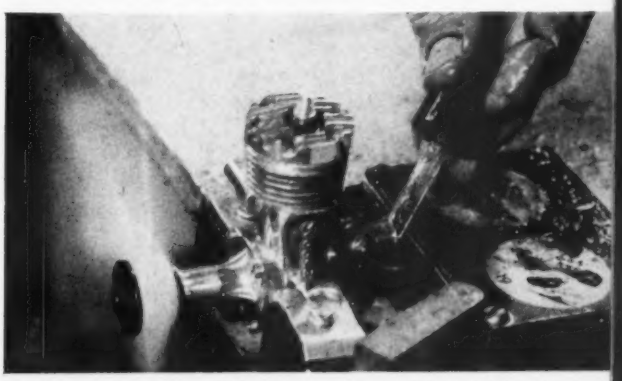
9 To start flip prop once or twice while choking intake with finger. Transparent tubing reveals any fuel movement. Choke till first pop.



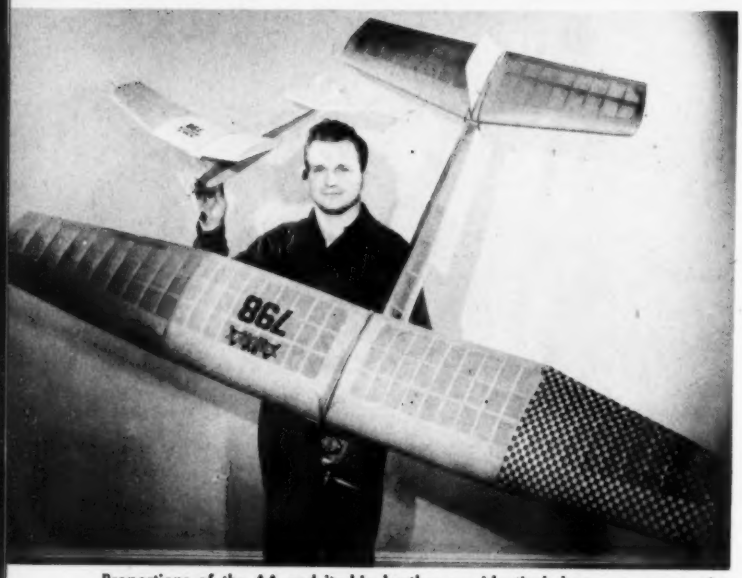
10 Remove booster connection when the engine is running. Leaving wires connected, burns out plug. Adjust valve—if necessary—to keep running.



11 Tune valve for steady running. Use rich mixture, and do not operate at high speed on first test runs. Rich mixture detected by smoky exhaust.

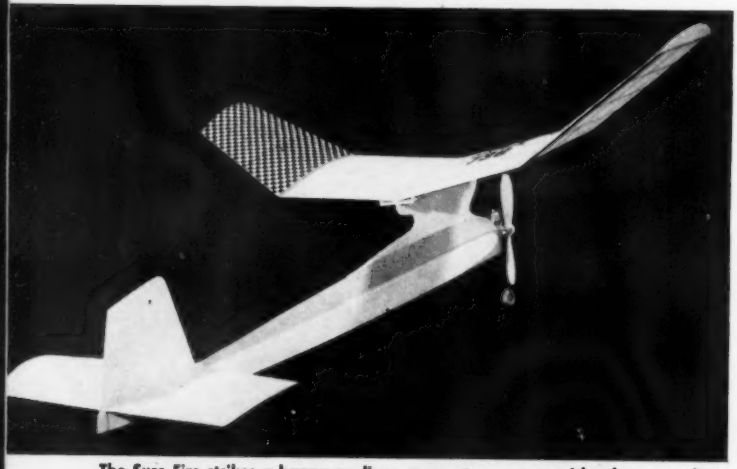


12 You won't go wrong injecting few drops castor in intake about every 30 sec. of running. If engine gets very hot, stop, allow to cool.



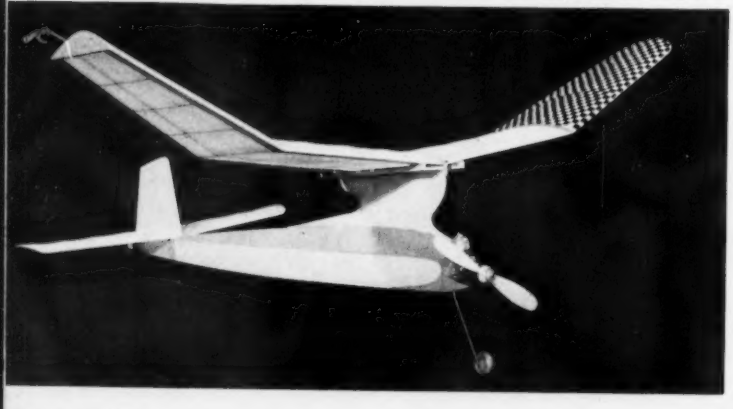
Proportions of the AA and its big brother are identical; however, construction is simpler in the smaller model. Any hot .60 engine is suitable for the C ship.

The high performance of this free flight has been proved in contests. Detailed plans for the AA version, construction data for C job.

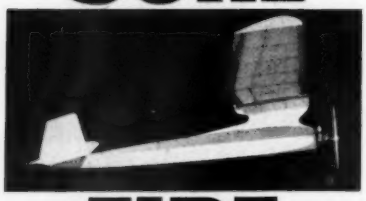


The *Sure Fire* strikes a happy medium; moment arms are neither long nor short, and the same applies to aspect ratio. Anderson .065 moves it up to Class A.

Sheet sides and bottom make sturdy modeling for handling, minimizing paper tears on fuselage. Wing is flat-bottomed on the AA, undercambered wing in C.



SURE



FIRE

by FRANK EHLING

The original D version of the *Sure Fire* won its share of contests so the basic design seemed a good bet for 1951, both as an AA ship and as a Class C job, the D class having been killed before the 1950 season started. A lot has been said about the bad points of scaling a design up or down to adapt it to other classes but the *Sure Fire* performs well in any size. Our tests bear that out.

Full detailed plans are presented for the AA version, but the more skilled builder will have no trouble in working up the C giant from the semi-detailed three-view which gives wing and tail construction. You will note data on the three-view for both AA and C. For the C model, a big Dooling, McCoy, Spitfire, and so on, will give top results. Ours was fitted with a 12" *Aero Prop*. It will hold its own with any contest free flight.

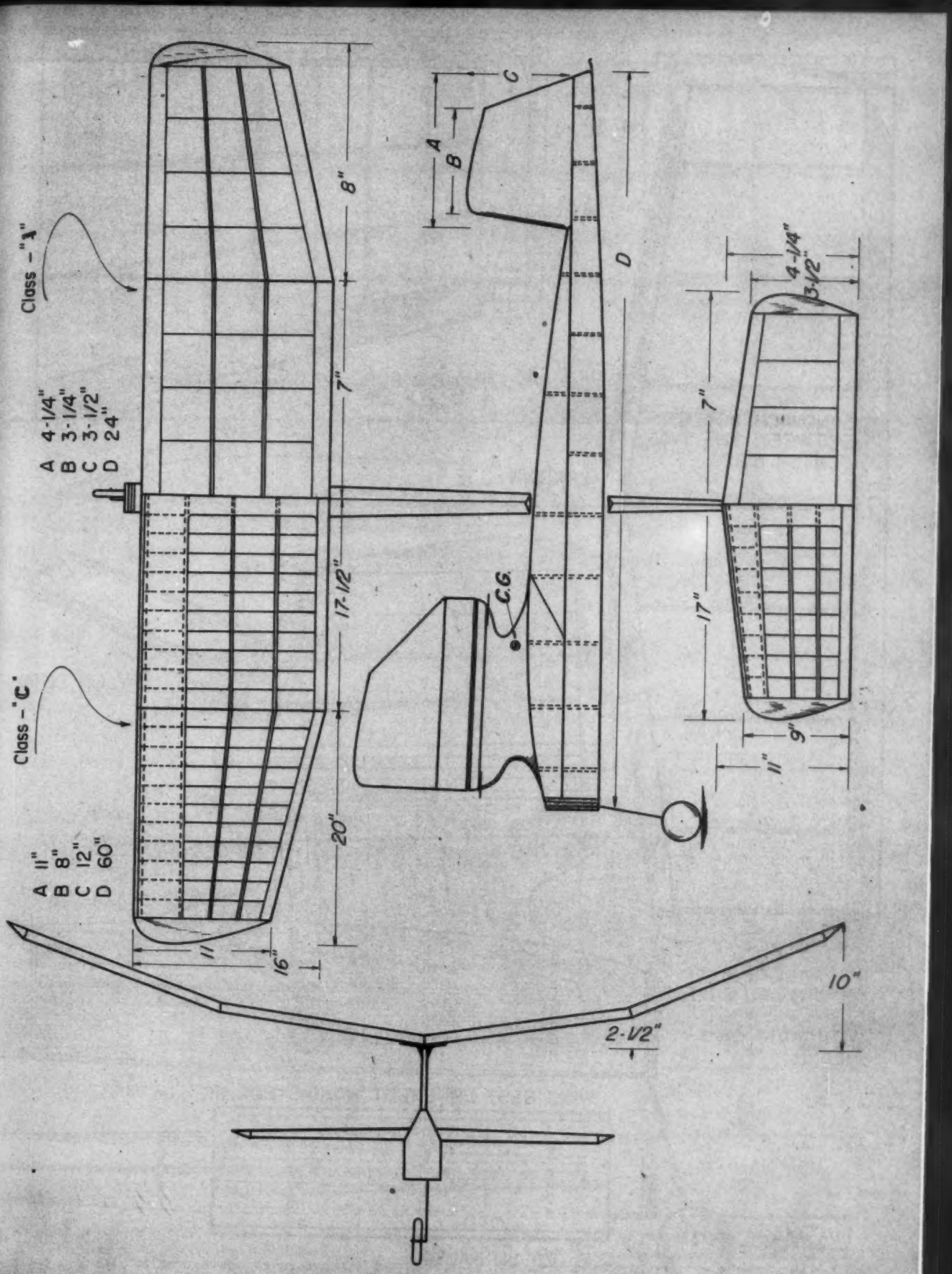
The original D model was covered with *Silkspan*. However, after it was flown for one season, it was recovered with nylon. Nylon covering is the best possible protection to stand up in contest flying. Be sure that the model is well doped and fuel proofed. You should fly it in both calm and windy weather to learn all its peculiarities. If you can fly in calm or in the wind, you will be sure to take home prizes—there are many model builders who think that they cannot fly in wind, and therefore, hesitate to do so in a contest. Try "wind" flying. It's easy.

Directions for the AA model. The wing is not high aspect ratio, nor is it low. The fuselage is not short coupled nor does it have long moment arm. The model seems to strike a happy medium, turning in one good flight after another. The fuselage cross section, while a little large, does not seem to alter the performance of the model whatsoever. The AA version uses a thin flat section, both in the wing and in the stabilizer. The fuselage has sheet balsa sides and bottom, and sheet covered front section. This means good handling qualities.

Start the AA by drawing the plan to proper size, making sure that you have all the material on hand. A little patience will pay off a model you will be proud to fly, and you will be up there with the rest of the winners throughout the season, if you don't forget the dethermalizer fuse when you launch your model.

Making the fuselage. Cut the two sides out of 1/16" balsa sheet. If you can obtain quarter-grained balsa (speckled appearance), by all means use it. It produces the best possible fuselage for a given weight. Now cut the required bulkheads. Start assembling by cementing the sides at the rear, then cement the bulkheads in place, working from rear to front. As you go along, check the fuselage to make sure that it is not out of line.

After the bulkheads have (*Continued on page* 48)


Class – "A"
A 4-1/4"
B 3-1/4"
C 3-1/2"
D 24"
8"
7"
17-1/2"
20"
Class – "C"
A 11"
B 8"
C 12"
D 60"
11"
16"
C
A
B
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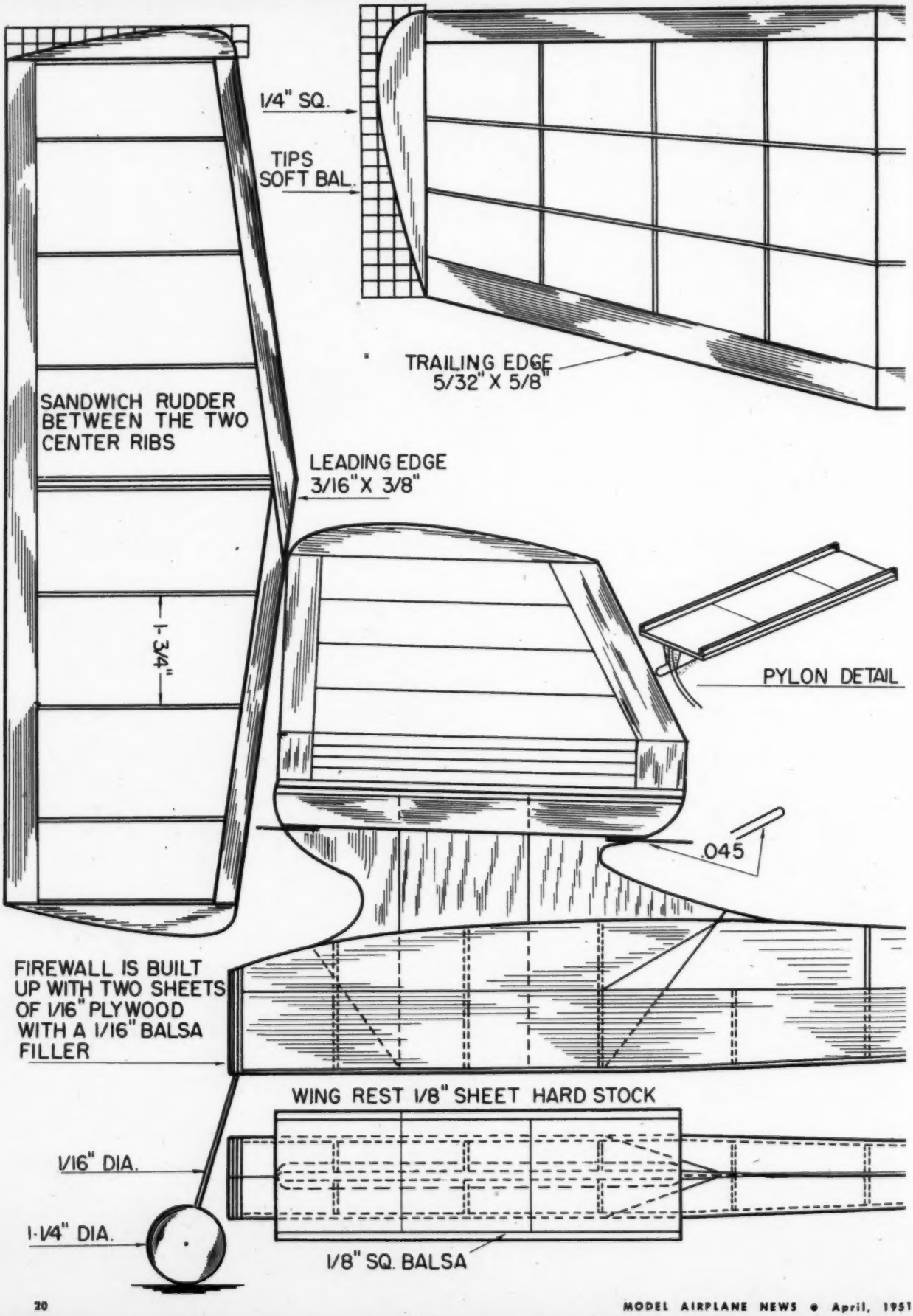
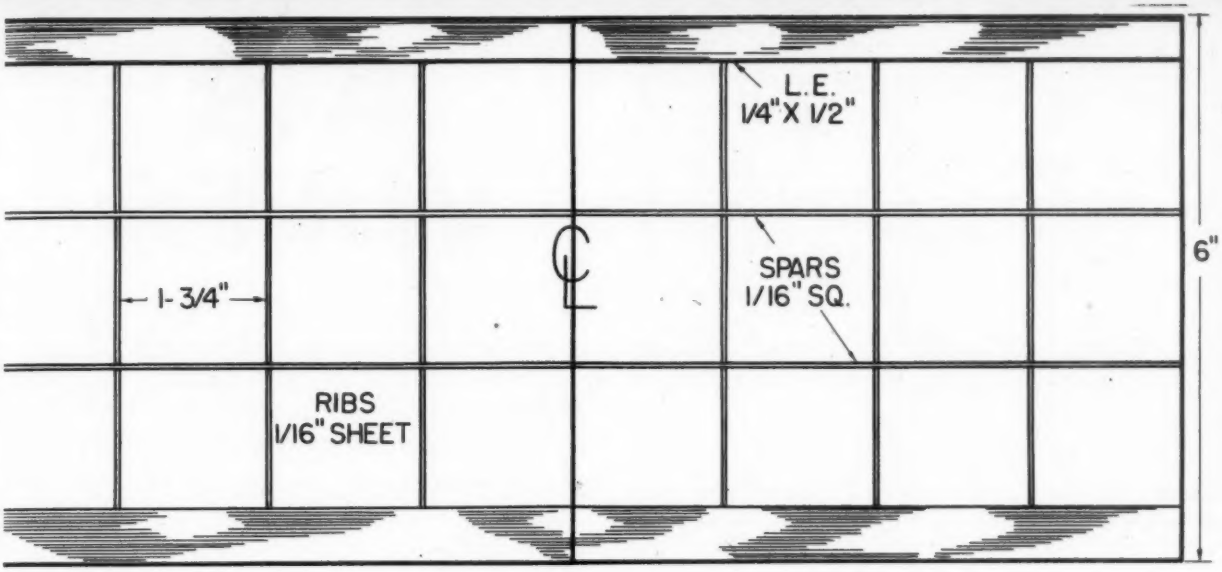
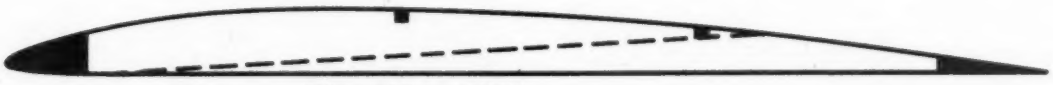
C.G.
4-1/4"
3-1/2"
7"
17"
9"
11"
10"
2-1/2"

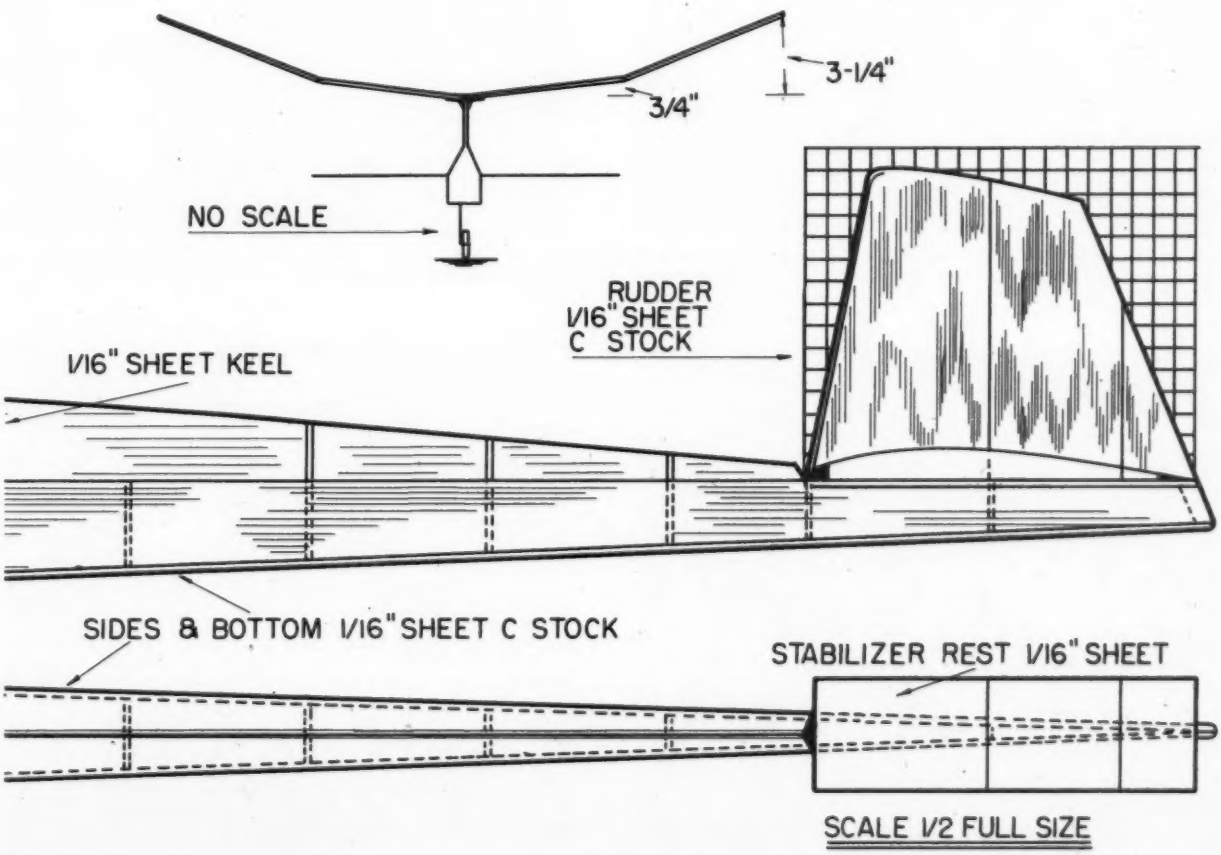

1/4" SQ.
TIPS SOFT BAL.
TRAILING EDGE 5/32" X 5/8"
SANDWICH RUDDER BETWEEN THE TWO CENTER RIBS
LEADING EDGE 3/16" X 3/8"
1-3/4"
PYLON DETAIL
.045
FIREWALL IS BUILT UP WITH TWO SHEETS OF 1/16" PLYWOOD WITH A 1/16" BALSA FILLER
WING REST 1/8" SHEET HARD STOCK
1/16" DIA.
1-1/4" DIA.
1/8" SQ. BALSA





RIB FULL SIZE

NOTE.
TAPERED WING & STABILIZER RIBS ARE CUT AS SHOWN. RIBS-1/16" SHEET



SCALE 1/2 FULL SIZE

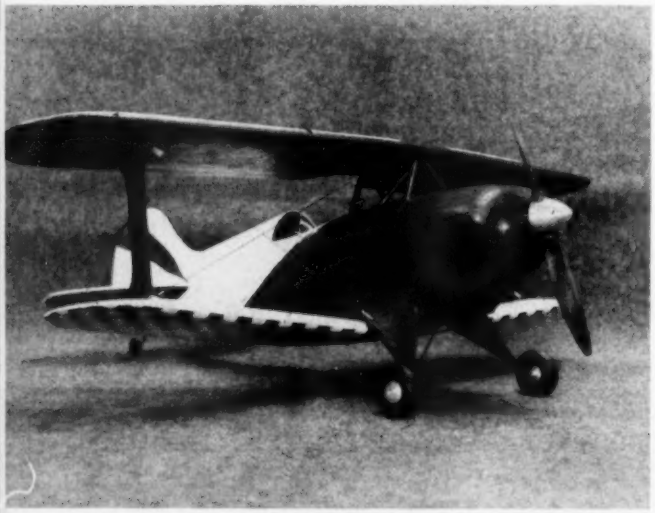
AIR WAYS

From all points of the compass come these inspiring pictures of outstanding models. If you enjoy looking at the other fellow's airplane, how about sending in your photos?

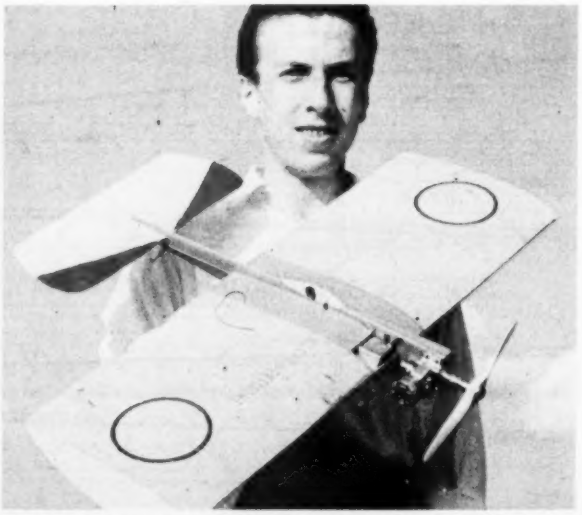
Get out of here with that XXX! One Junior that didn't come out the way Testor planned it. Dale Root, Oakland, Cal., experimented with this Forster 29 job.

Proving that speed addicts can build free flight, Jack Gray, Little Rock, Ark., turned out this Ohlsson 60 ignition ship. Note the speed-type nose.

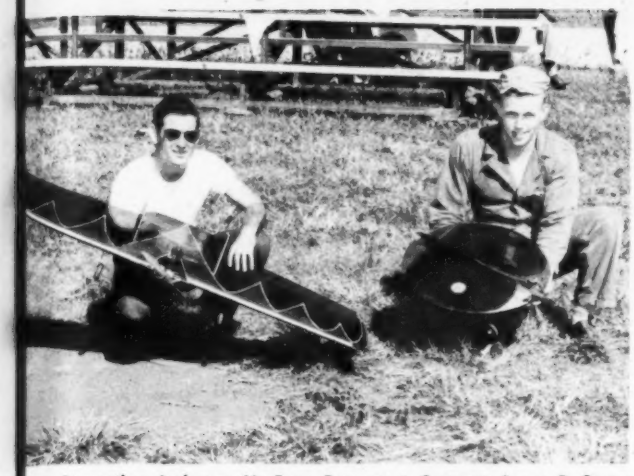
Lieut. Arthur Stevenson, 514th Weather Reconnaisance Squadron, flew this Waco biplane at a club meet, Anderson Air Force Base, Guam.



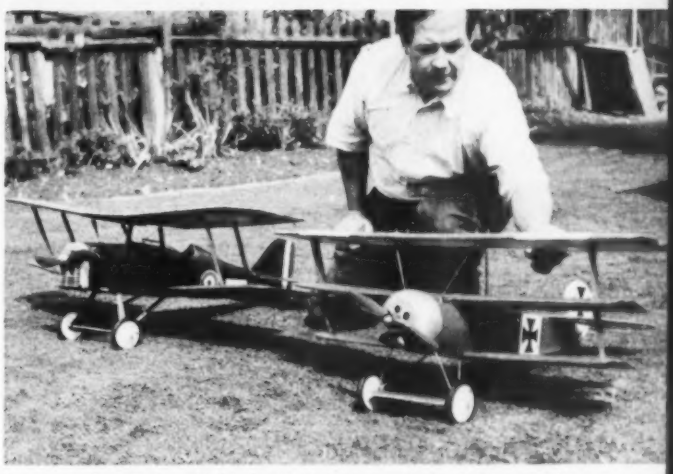
Made from plans in August 1950 MAN, Betty Skelton's *Pitts Special*, is the handiwork of L. A. Pfeiffer, Dallas, Texas. It both looks and flies well.



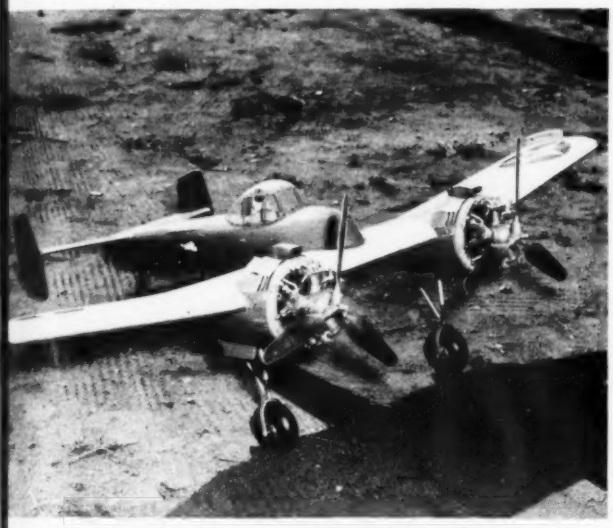
Italian stunt champion for 1950, Piero Gnesi, Pisa, flew this McCoy 29-powered model to firsts in 3 Nats, 3 Internats. Span is only 32".



At another Anderson Air Force Base meet, Sergeant James R. Berger brought this flying plank. Pfc. Lewis W. McLaughlin, entered flying saucer.

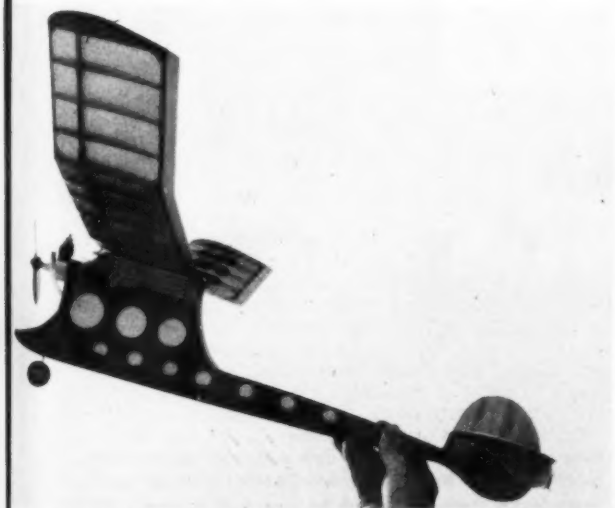


One-seventh scale free flights by P. E. Norman, England. *SE-5* weights 4-1/4 lbs., marked after Mannock's machine. *Fokker* after Richtofen's.



Two Burgess *M-5* engines power Grumman *Skyrocket* by Leon Tefft, Chicago. Note the landing gear, props, and cockpit details. It's a control job.

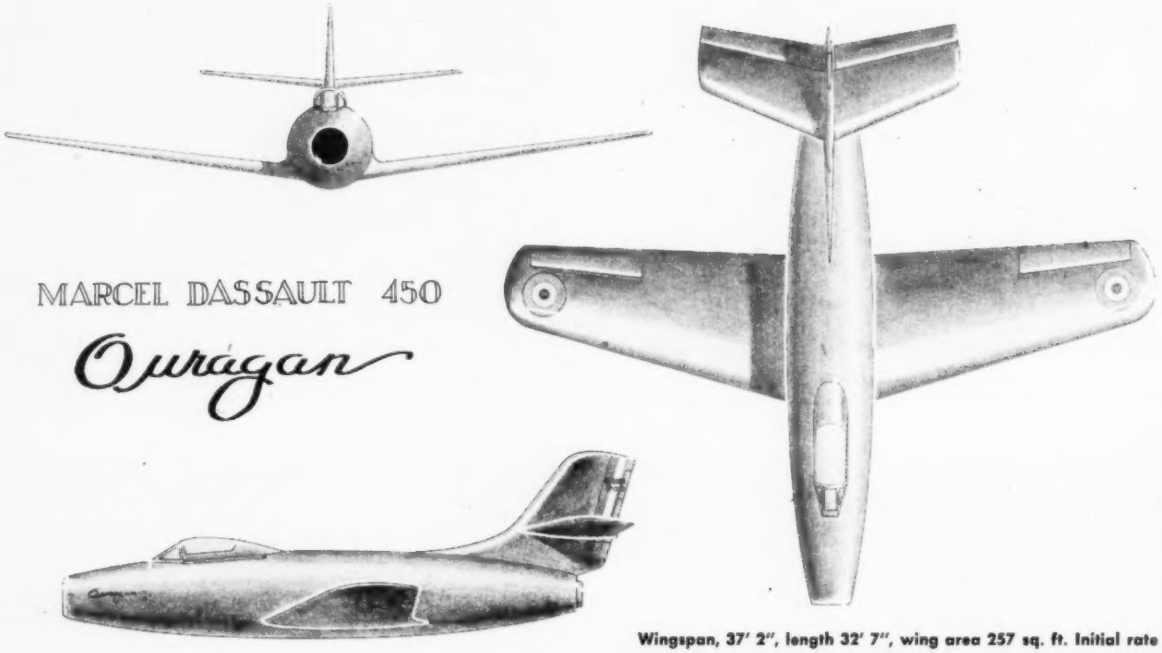
L. O. "Butch" Corbly joined the 30-minute club with three 10-minute flights for perfect total at *San Diego Aeroneers* contest. Ship is a Comet *Sailplane*.



After reading Charlie Grant, C. M. Montplaisir, Stroudsburg, Pa., developed this novel high-thrust job. Has right turn traits like the pylons.

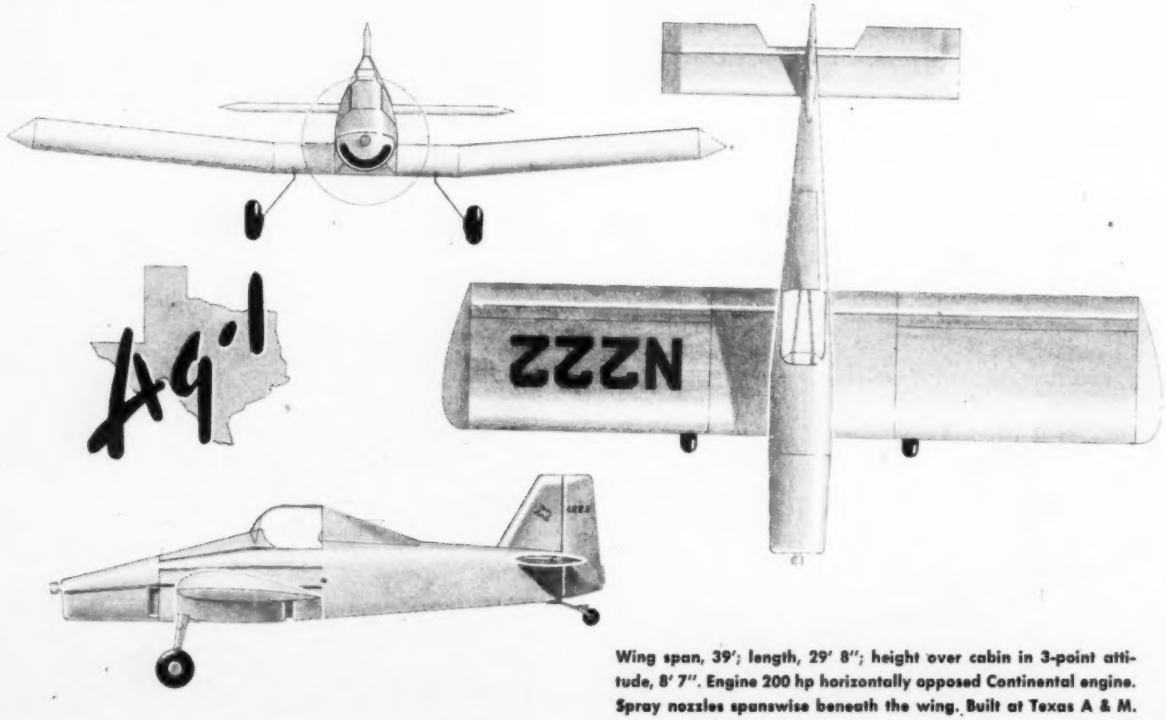
Nine-foot bomber, by N. G. Taylor, London, carries its own booster battery. Weighing 11-1/2 lbs., has a 15 cc engine. Those airwheels are 6 inchers.

No. 1 — Ouragan



Wingspan, 37′ 2″, length 32′ 7″, wing area 257 sq. ft. Initial rate of climb, 7,800′ per min., 2,000′ per min. at 30,000′. Speed, 600 mph on the deck, 535 mph at 30,000′. To build sweptwing, too.

No. 2 — AG-1



Wing span, 39′; length, 29′ 8″; height over cabin in 3-point attitude, 8′ 7″. Engine 200 hp horizontally opposed Continental engine. Spray nozzles spanswise beneath the wing. Built at Texas A & M.

planes in the news .....

Possibly world's most maneuverable bomber, British *Canberra*, Avon jets.

COLLECT THESE PLANS

Start saving these three-views. Paste each on a file card or cardboard. Two of the world's most interesting planes will be published here each month.

by DAVID A. ANDERTON

An expert monthly analysis of new aircraft of value to all model builders

▸ The Royal Air Force's first jet bomber, the *Canberra B Mk. 2*, is well on its way into quantity production. This three-place medium bomber, powered by two Rolls-Royce *Avon* turbojets, is already coming off the assembly lines of the English Electric Co. Ltd., its parent firm. And in addition to this supply, Canberras will be turned out by A. V. Roe and Co. Ltd., Manchester; Handley Page Ltd., Cricklewood; and Short Bros. and Harland Ltd., Belfast.

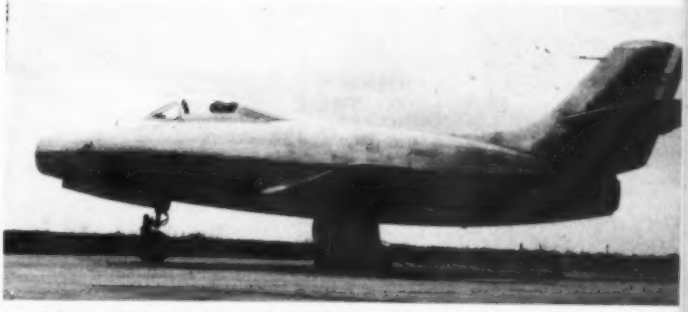
But more airplanes are useless without more engines, and the big Avon engines are also in expanded production. In this job with Rolls are Napier and Son, Ltd. and Bristol Aeroplane Co., both firms with long standing and experience in the reciprocating and jet power plant field.

In these days of sweepback and thin wing sections, it comes as somewhat of a shock to see a fast jet aircraft with neither. Apparently the designers of the Canberra did not believe it necessary to complicate the structure for the sake of a few added miles per hour. But they did believe it necessary to have a maneuverable airplane on the deck and in the stratosphere; and to that end they specified a low wing loading, which meant a large wing. Along with its size, it is also a thick wing—which means more rugged, lighter weight structure to carry the loaded weight of the plane at high "g" loadings. Wing span is 64′; length, 65′ 6″; height, 15′ 7″.

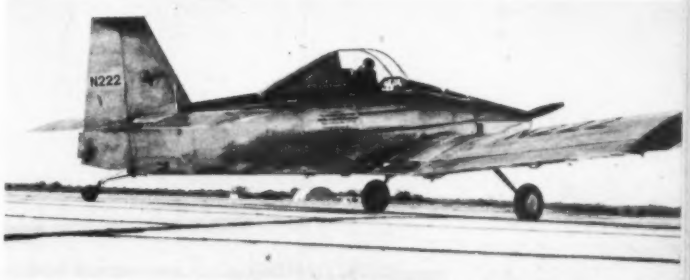
A variable-incidence horizontal tail improves control at high subsonic Mach numbers, and finger-type dive brakes outboard of the nacelles are fitted. Range can be increased with wingtip tanks.

Outside of the Canberra's conventional looks, the greatest cause for wonder is the combination of speed and maneuverability. In fact, no defensive armament has been built into the plane, because the RAF is relying on its performance at altitude to be able to evade enemy attack by simply running away—tactically, of course.

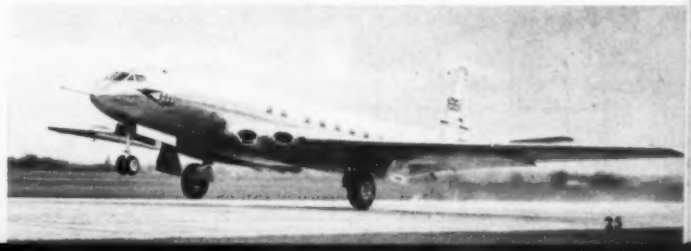
Incidentally, readers with long memories can recall when Goring made the same (*Continued on page* 44)

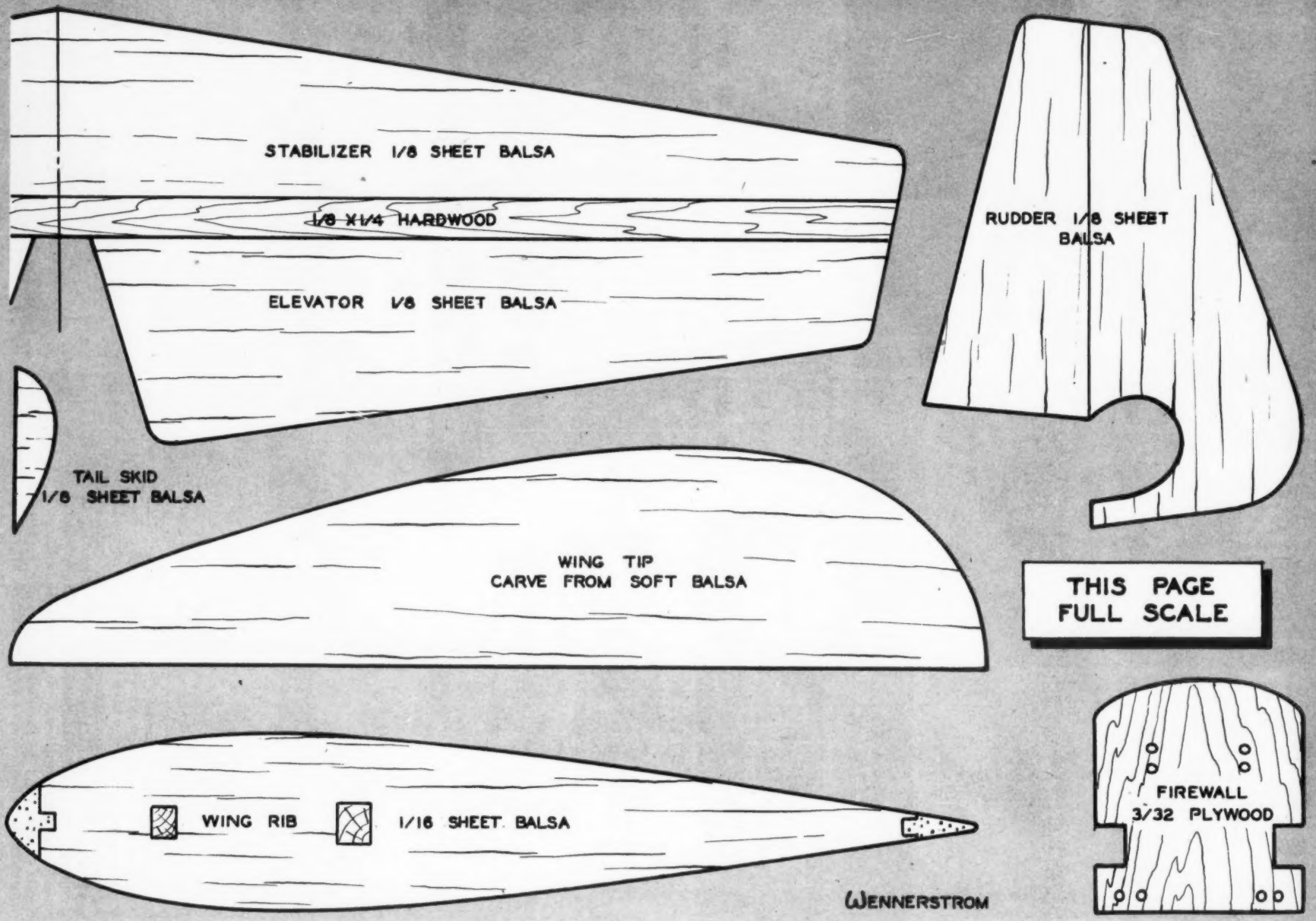


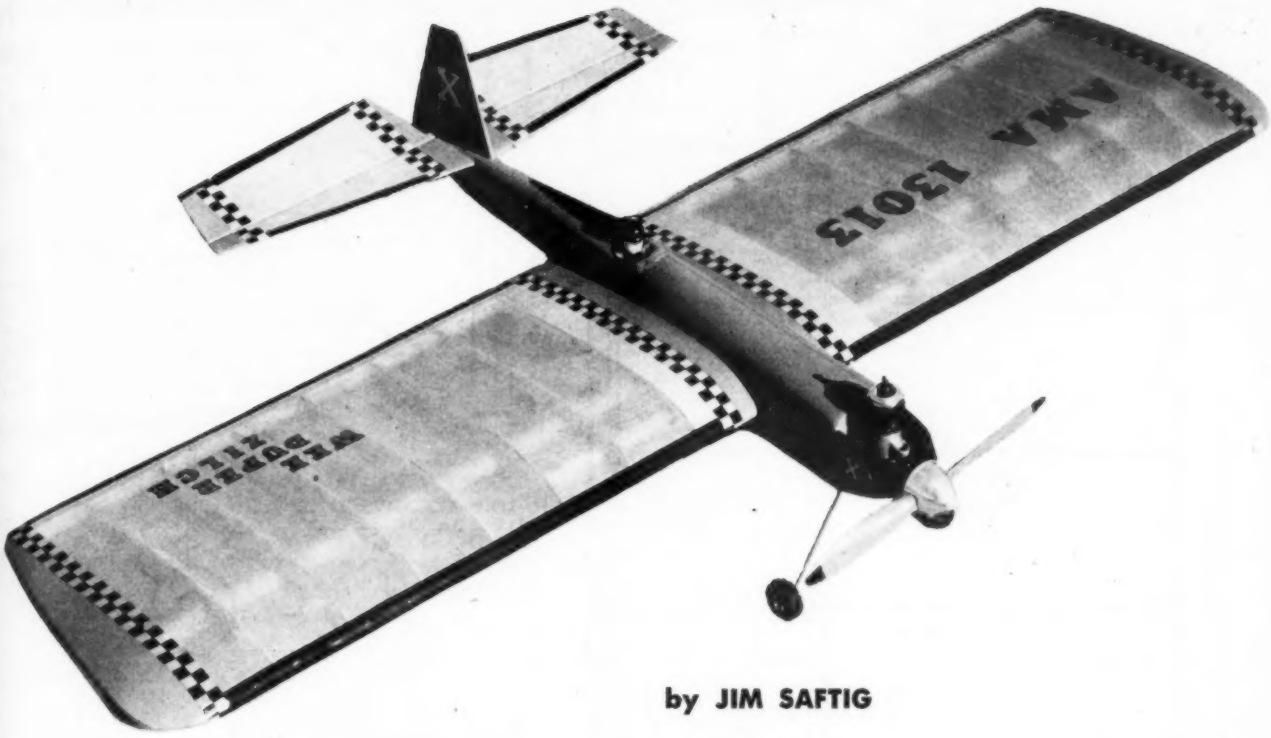
For defense of Western Europe, France builds 750 speedy *Ouragan* jets.



Above — Ideal stunt scale model is Wieck-designed *AG-1* crop spray plane.
Below — De Havilland four-jet liner will have more powerful engines.



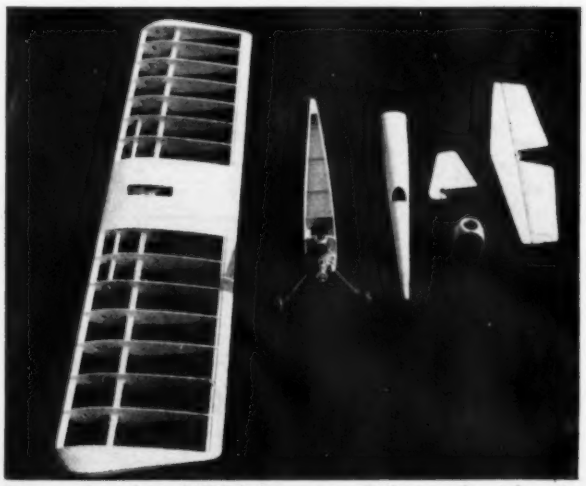

STABILIZER 1/8 SHEET BALSA
1/8 X 1/4 HARDWOOD
ELEVATOR 1/8 SHEET BALSA
TAIL SKID
1/8 SHEET BALSA
RUDDER 1/8 SHEET
BALSA
WING TIP
CARVE FROM SOFT BALSA
THIS PAGE
FULL SCALE
WING RIB
1/16 SHEET BALSA
FIREWALL
3/32 PLYWOOD
WENNERSTROM



by JIM SAFTIG

wee duper zilch

Designed around the Class A engines, the latest product of the old stunt master is an amazing performer, combining smooth pattern flying with tight and violent stunts



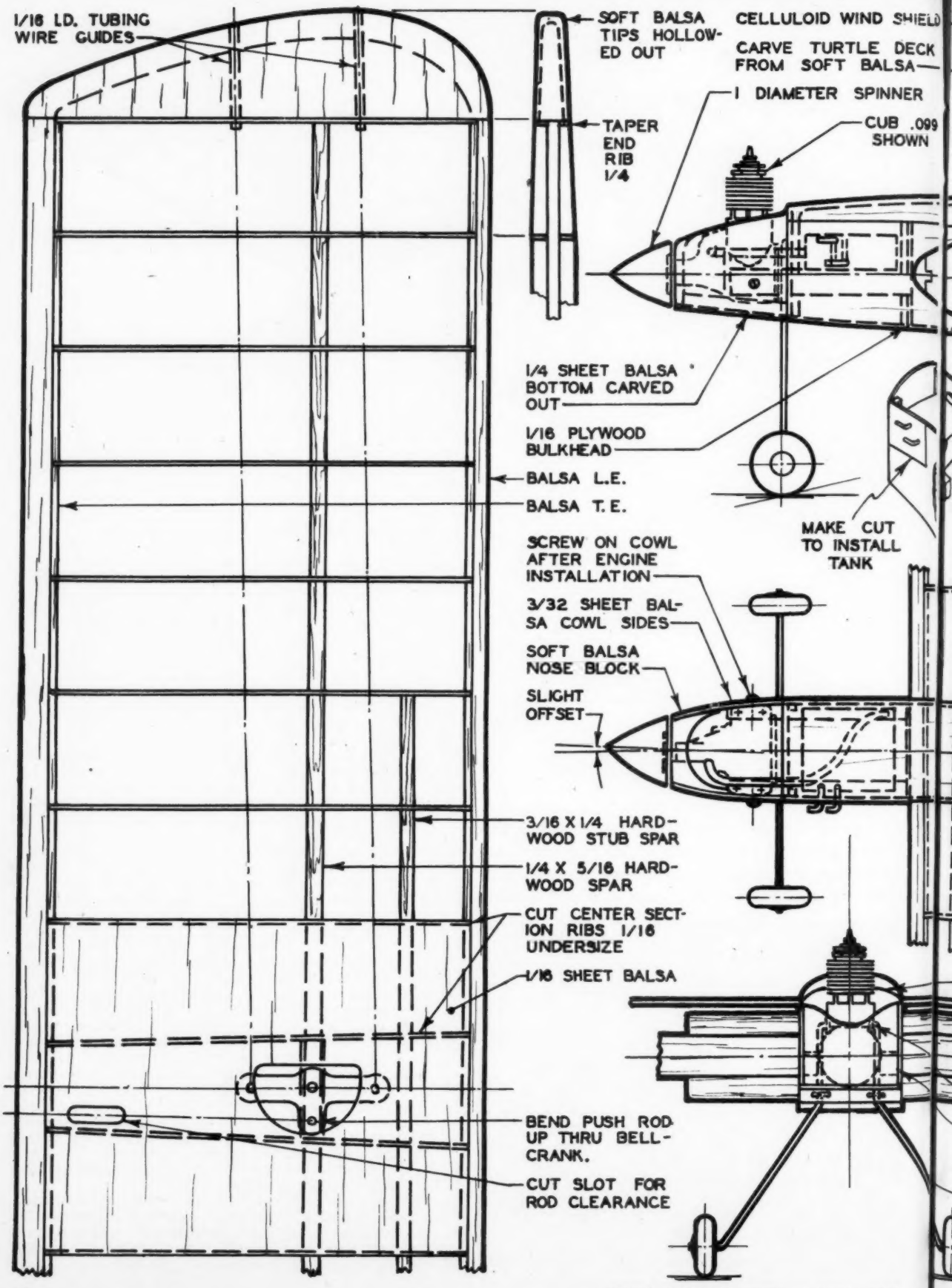
Structure shows how skillful design means a high strength-weight ratio.

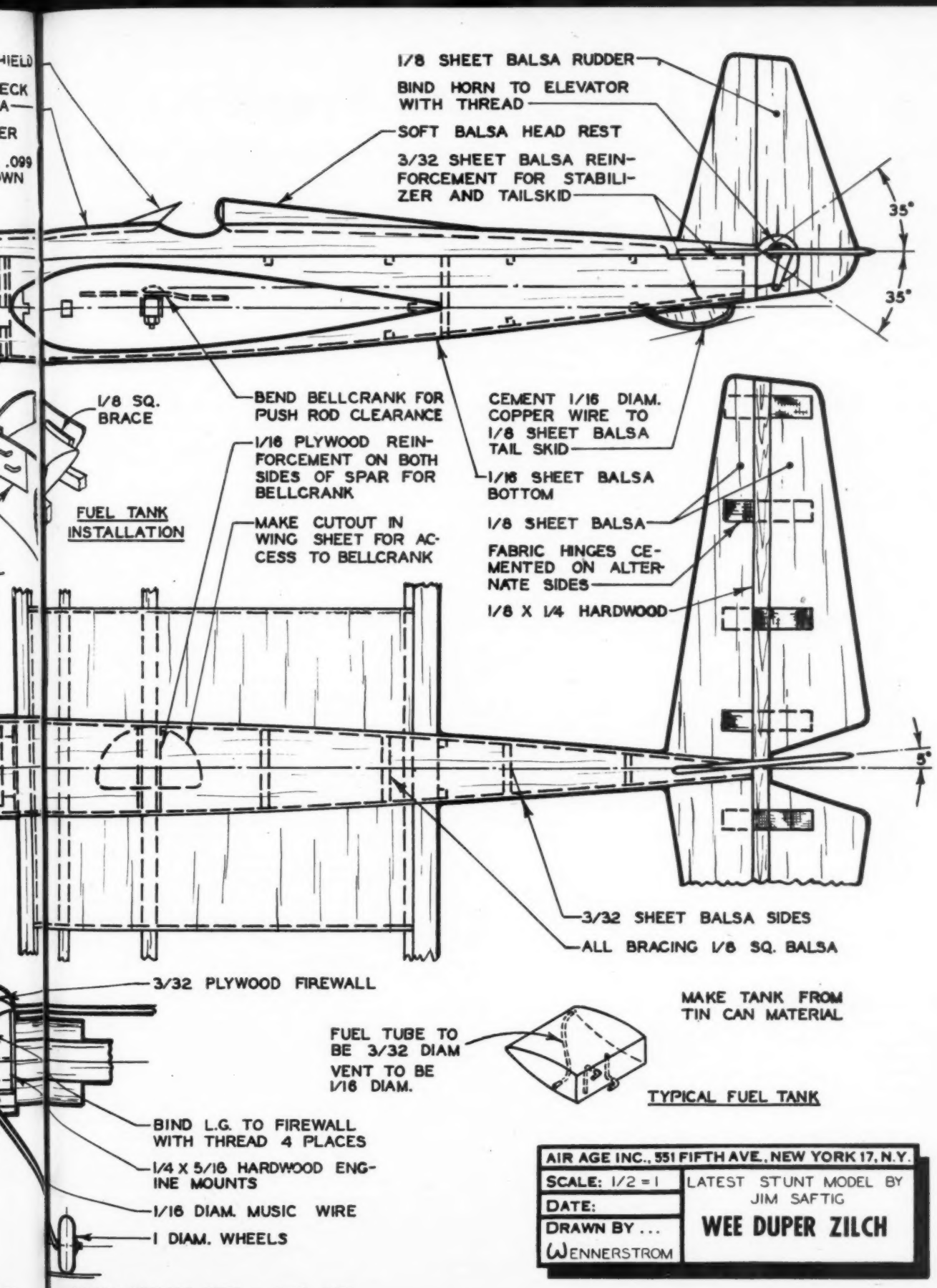
▸ The *Wee Duper Zilch* is the latest of the line of Zilches. It is designed around the class A engine, and tests were made with a Cub .099 and .074. This ship incorporates the latest airfoil section that we have been using in our latest experimental designs. Smooth pattern maneuvers are easily executed with this ship as well as the very tight and violent stunts that are impossible to execute with most stunt jobs today. You will be greatly surprised and very pleased with this amazing ship. A stick job was first worked out to check moment arms, etc. This was abandoned as soon as it had served its purpose. The stick job had been built and flown many months before the birth of the Wee Duper.

Construction of the plane is very simple. The wing is perhaps the simplest part of the whole job to assemble. It can be very nearly put together completely before gluing.

Fuselage. Slightly taper 3/16" sq. piece of balsa and glue rear of fuselage sides to it. Hold this in place with pins or clothespins. Add front plywood bulkhead and second plywood bulkhead with motor mounts in place and be sure that the sides are lined up in proper position. Allow sufficient time to dry before going on. Add 1/8" braces as shown and allow to dry. Drill holes for threading of gear and add landing gear. Make sure that this is lined up perfectly before continuing. Add 1/16" sheet to bottom of fuselage after putting in reinforcements 3/32" sheets at rear of fuselage as shown. Thoroughly sand this whole unit, being careful not to sand top sides of fuselage where top forming block glues in, then add one coat of sanding sealer to this unit and sand lightly with fine sandpaper. Apply paper covering to this portion with thin dope and then apply two coats of sanding sealer. Sand lightly, being careful not to tear the tissue. Then add one coat of dope over complete assembly. Draw rib section, using template, on sides of fuselage in correct position, making sure that you measure down from the top of the fuselage to the center of your leading edge and center of your trailing edge. Do this on both sides so your wing will be in the correct position. Make sure that everything is sanded smooth.

Wing. Slide all of the ribs onto your main spar, being sure you have included the sub-spar in the operation. Add leading and trailing edges, then glue all necessary joints well. Allow to dry thoroughly; then check for any warps. Add the reinforcing plywood on (*Continued on page* 52)


1/16 LD. TUBING WIRE GUIDES
SOFT BALSA TIPS HOLLOWED OUT
CELLULOID WIND SHIELD
CARVE TURTLE DECK FROM SOFT BALSA
1 DIAMETER SPINNER
CUB .099 SHOWN
TAPER END RIB 1/4
1/4 SHEET BALSA BOTTOM CARVED OUT
1/16 PLYWOOD BULKHEAD
BALSA L.E.
BALSA T.E.
MAKE CUT TO INSTALL TANK
SCREW ON COWL AFTER ENGINE INSTALLATION
3/32 SHEET BALSA COWL SIDES
SOFT BALSA NOSE BLOCK
SLIGHT OFFSET
3/16 X 1/4 HARDWOOD STUB SPAR
1/4 X 5/16 HARDWOOD SPAR
CUT CENTER SECTION RIBS 1/16 UNDERSIZE
1/16 SHEET BALSA
BEND PUSH ROD UP THRU BELLCRANK.
CUT SLOT FOR ROD CLEARANCE



AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: 1/2 = 1	LATEST STUNT MODEL BY JIM SAFTIG
DATE:	**WEE DUPER ZILCH**
DRAWN BY ... WENNERSTROM	

design detail

Gas Props . . .

Behind many a crack-up, or a plane that won't fly right, is a wrong propeller. Pigeon-hole these handy facts.

by H. A. THOMAS

No experienced, successful gas modeler ever slights the importance of his propeller. Its precise diameter, blade shape and area and its pitch greatly determines the model's speed, climb—even to some extent its glide—and in the case of free flight ships particularly, the propeller ties in closely with flight adjustments.

The technical side of propeller design has been adequately covered in past issues of this publication. (A valuable reference in point is that written by Chester Hodgkins in the October, 1949 Model Airplane News.) The aim here is to acquaint a relative beginner with some practical considerations in the selection of gas model propellers.

At least one manufacturer prints handy tables of recommended sizes and pitches for various model-engine combinations. Without such help, the beginner should depend on his model dealer's advice plus results he observes among his model group members.

The modeler who has experienced good flights in the beginning with a propeller arbitrarily selected will justifiably read these lines lightly. But a time may come when an unfortunate propeller choice will cause a promising model to fall short of expectations regardless of what corrective measures are taken with the model itself.

Think of a large free flight ship, climbing steeply, as a car moving uphill in low gear. The transmission allows a high engine speed to be maintained for efficiency, forward speed being sacrificed for power. Thrown quickly into high gear, the engine would likely stall. So this model, to get fullest efficiency, uses a low pitch propeller and, since the model itself is large and the airspeed is low, the blade area may be considerable. Another extreme is to compare a fast-flying speed model with high pitch prop to a car which is making good speed on a level highway. A higher gear is now used since momentum has been gained, and the wheels must rotate faster to keep pace. Pitch, rather than rotation speed, is the difference applied to the propellers in these cases.

Stunt models utilize low pitch propellers of generous blade area. When airspeed slows, as in some maneuvers, the low pitch and wide blades give dependable thrust. Paddle-blade and square-tipped props have been popularized by stunt flying.

Free flight models can benefit from extra blade area under power but its braking effect in glide makes propeller selection a compromise. Since larger free flight ships have relatively smaller propellers, this resistance lessens as a problem. Consequently a folding gas prop is more worthwhile in smaller models than in the 600-1000 sq. in. area jobs. Shulman successfully used folding props in his class A contest models (see sketch) but they are seldom seen nowadays. In the case of small, clean, fast-flying free flight models, higher pitch is resorted to.

The beginner is wise to avoid use of any metal props, particularly those with threaded blades. These are bad medicine from the personal safety aspect—they can cut like a buzz saw—and they make for serious engine damage in a crackup. Only in smallest AA models is a metal propeller at all suitable and even here the serious builders prefer wooden ones.

Balance, after a first inspection for grain irregularities, precedes installation of a prop. A knife blade is handy, the shaft hole being centered over the upturned edge. Any noticeable heaviness in one blade can be offset by additional finish to the other. Carving away a heavier blade is not recommended if the cross section is altered.

After a propeller is tightened to the shaft (positioned so it tends to stop horizontally), it ought to be checked for "track". (See sketch.) View the mounted propeller from the side and turn it through several revolutions, carefully comparing one blade's side profile to the other. If the shaft hole or back washer is misaligned, the larger pitch of one blade over the other can have a detrimental effect. File the back of the hub to compensate.

Propellers look pretty much as they did in the earliest gas model days fifteen years ago. The difference principally is that now we know more about fitting the best propeller to a particular model.

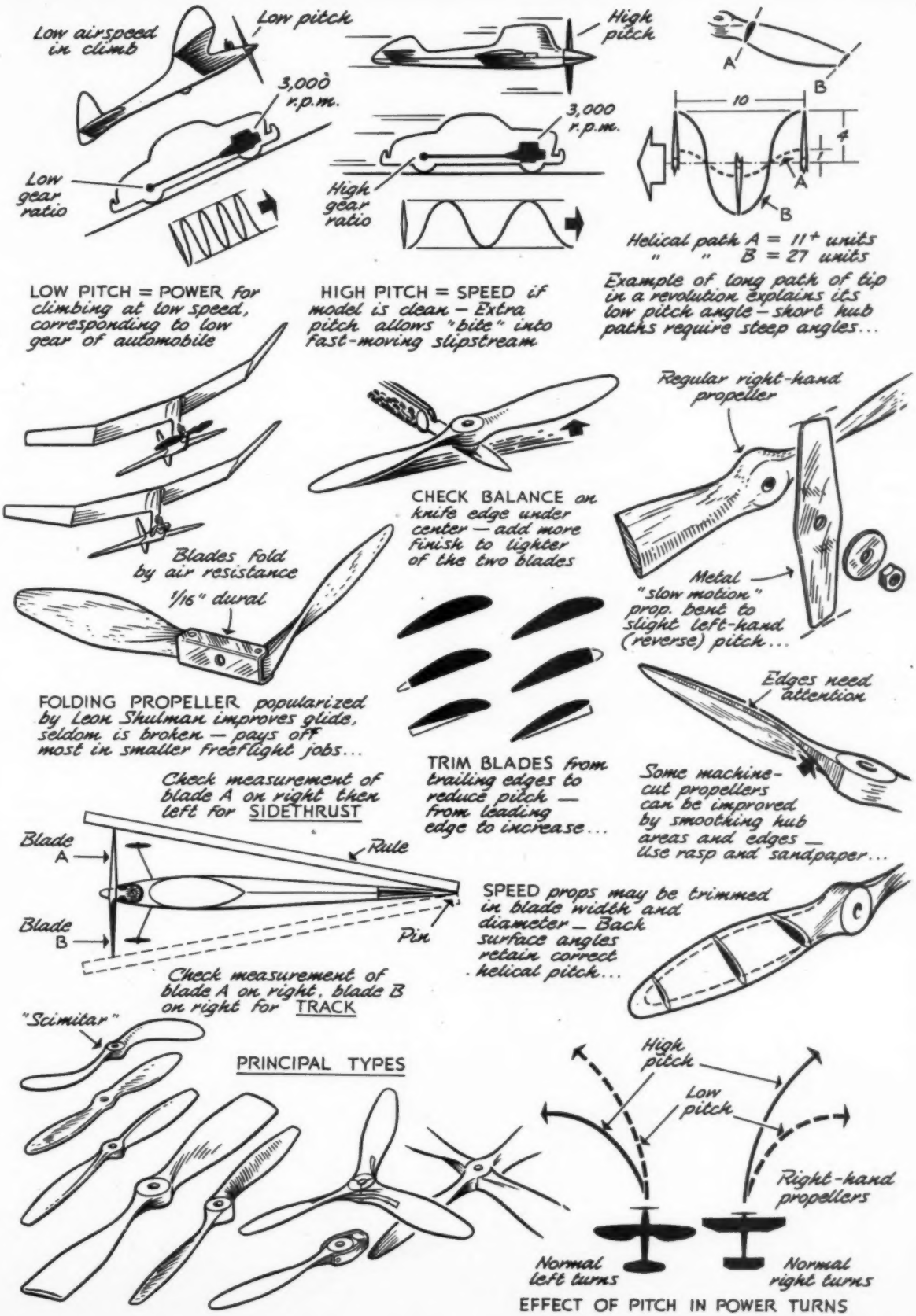
John Sadler, who systematized model (free flight gas) adjustments at a time when few modelers thought it involved more than a twist of a rudder tab, was quick to utilize propeller pitch as an adjustment in flight trim. He would tighten the normal left power turns of his low-wing models with higher pitch props; achieve wider turns to nearly straight-away climb with lower pitch props. From another source is the finding of pylon model flyers who use higher pitch to open the usual right turns and lower pitch to tighten them. The resistance to rotation which the greater pitch exerts on the engine, serves to twist the model in the opposite direction. (See sketch.)

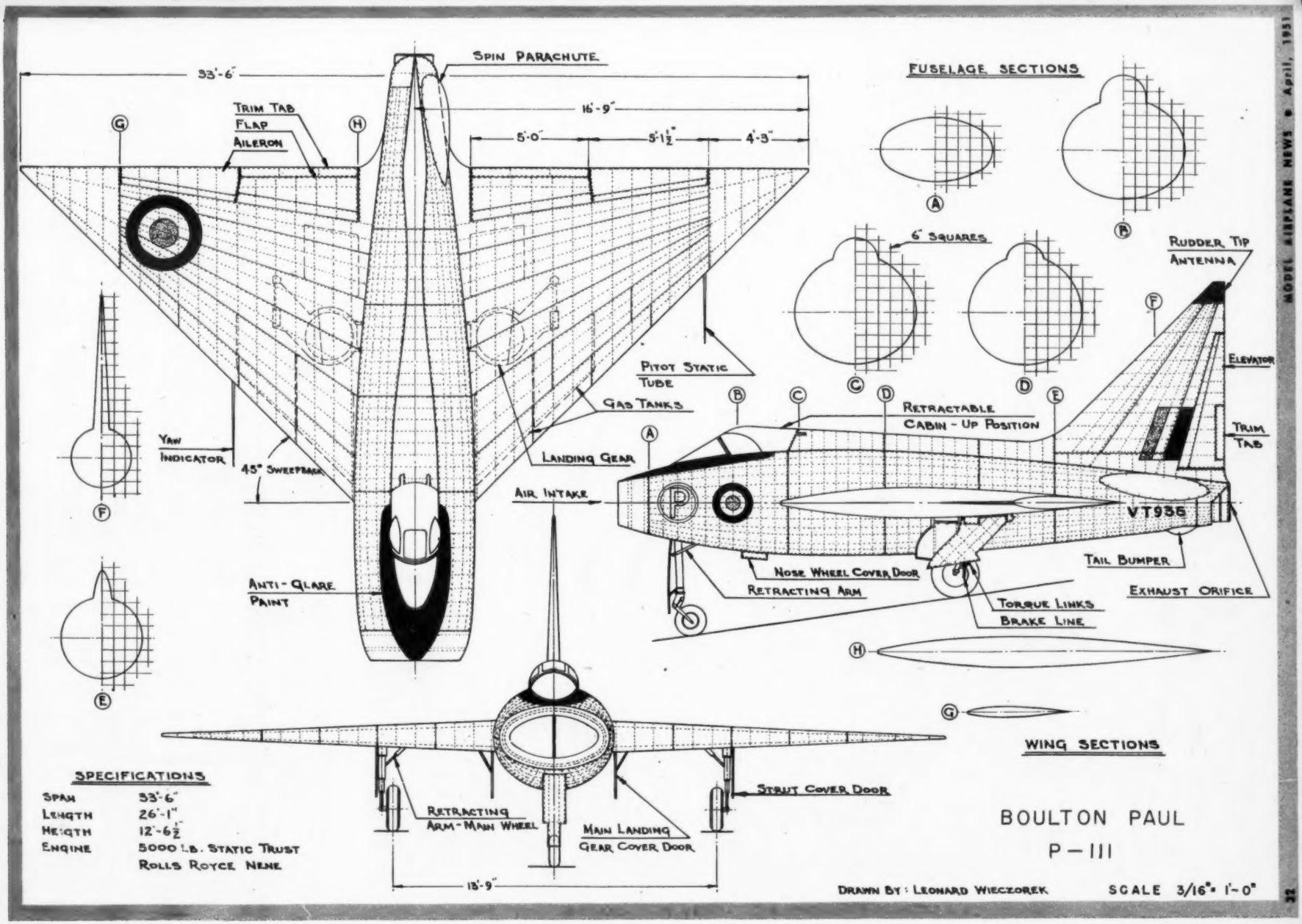
The point we stress here is that if real effort is put forth to carry a free flight ship to optimum adjustment, the propeller pitch can be varied along with thrust adjustments, tab settings and warps to airframes.

The characteristic "twist" in a propeller blade is intended to steepen angles near the hub and flatten those toward the tip to equalize the "pull" all along the blade. Since a point on a blade describes a helical path in a revolution, this path is quite long for a tip station point—much shorter (due to less diameter) for a station point near the hub. (See sketch.) If a propeller were carved with, say a 15° constant pitch angle along its blade, it would in reality be of varying pitch—low pitch at the hub and high pitch at the tip. What would be the practical result? Only a small portion of the blade would operate efficiently for a given engine and air speed, with areas to one side racing so to speak, and those on the opposite side being literally stalled out.

Each model engine has a speed range at which it operates most efficiently. The propeller should be such as to allow this operating speed without burdening it or permitting it to race beyond it. An engine will refuse to run at all—or at best very poorly—with an oversize propeller. This baffles many beginners who follow engine instructions carefully but have unknowingly selected too large a propeller for the particular engine.

Among unusual types of propellers are single-blade ones, curved *scimitar* blade types, and those having three and four blades. Single-blade (*Continued on page* 52)


Low airspeed in climb
Low pitch
3,000 r.p.m.
Low gear ratio
High pitch
3,000 r.p.m.
High gear ratio
A
B
10
4
A
B
Helical path A = 11+ units
" " B = 27 units
Example of long path of tip in a revolution explains its low pitch angle – short hub paths require steep angles...
LOW PITCH = POWER for climbing at low speed, corresponding to low gear of automobile
HIGH PITCH = SPEED if model is clear – Extra pitch allows "bite" into fast-moving slipstream
Regular right-hand propeller
CHECK BALANCE on knife edge under center – add more finish to lighter of the two blades
Blades fold by air resistance
1/16" dural
Metal "slow motion" prop. bent to slight left-hand (reverse) pitch...
FOLDING PROPELLER popularized by Leon Shulman improves glide, seldom is broken – pays off most in smaller freeflight jobs...
TRIM BLADES from trailing edges to reduce pitch – from leading edge to increase...
Edges need attention
Some machine-cut propellers can be improved by smoothing hub areas and edges – use rasp and sandpaper...
Check measurement of blade A on right then left for SIDETHRUST
Blade A
Blade B
Rule
Pin
Check measurement of blade A on right, blade B on right for TRACK
SPEED props may be trimmed in blade width and diameter – Back surface angles retain correct helical pitch...
"Scimitar"
PRINCIPAL TYPES
High pitch
Low pitch
Right-hand propellers
Normal left turns
Normal right turns
EFFECT OF PITCH IN POWER TURNS



SPECIFICATIONS

SPAN	33'-6"
LENGTH	26'-1"
HEIGTH	12'-6½"
ENGINE	5000 LB. STATIC TRUST ROLLS ROYCE NENE

BOULTON PAUL
P — III

DRAWN BY: LEONARD WIECZOREK

SCALE 3/16" = 1'-0"

PLANE ON THE COVER

A single seater, powered by Rolls Royce Nene, the Boulton-Paul is one of three such research projects.

BRITAIN'S LATEST TAILLESS JET, BOULTON PAUL P. 111, IS FOR TRANSONIC SPEED RESEARCH

The Boulton Paul P. 111, second of Britain's delta-winged research craft, made its first flight last October 12.

First, the British announced the Avro 707 (and one year or so later, the 707B—basically the same plane), a quickly built job intended to gather some badly needed data for the design of Avro's big jet bomber. And its performance was limited to high subsonic speeds. Second delta-winger to be announced was the P. 111. There is a third—a Fairey design. And that is the key to their intended role as research craft, because the delta wing does its best job in the transonic and low supersonic range.

Boulton Paul's design has a 45° sweepback of the leading edges. Total wingspan is 33-1/2', and wing area is 287 sq. ft. So, it's a small airplane, as are all known examples of delta-winged craft. The fuselage—about 26' long and 5-1/2' wide—houses the pilot and a Rolls Royce Nene turbojet which develops 5000-lb. sea-level static thrust.

It is difficult to identify the control surfaces. About the only thing that can be said with any guarantee of accuracy is that the vertical surface is a rudder. But the horizontal surfaces are another thing entirely. Obviously, they must act as ailerons and elevators and possibly flaps, because the P. 111 surely lands faster than the 707B which has no landing flaps. The main landing gear retracts into the wing at about the thickest point, and the nose wheel retracts aft into the fuselage. Tail-dragging landings are handled by a small bumper fairing mounting on the underbelly of the fuselage. Fuel tanks appear to be in the wing, ahead of and aft of the wheel well.

There are a few design features of special interest. One is the forward position of the pilot, so that he can get good down vision over the nose. This is because these delta-winged planes land at an abnormally high angle of attack. Another is the use of an anti-spin chute, housed in a little fairing toward the rear of the fuselage. This follows from the generally poor spin characteristics of triangular wings —characteristics which may even include the vicious tumbling—and a spin chute for quick recovery seems to be a necessity. And there is a bonus — the chute will brake a landing if the pilot elects to land three-point instead of tail down.

One other tricky feature is that the tips of the wing and rudder are detachable. This, it is said, is to enable engineers to check the effects of clipping the wingtips. The general reason for wing-clipping is to improve the rate of roll. But rate of roll is inherently well-supplied to all delta-winged craft, and it would hardly seem necessary to try to improve it.

boulton paul delta

Business end of the BP delta sucks in three tons of air per minute, at an average roomful every second.

Left—*Illini Liners*, University of Illinois. Pres., 2nd-Lt. D. H. Brazelton, center, front. Right—Howard Borden, Temple City, Cal., FAST member, and team racer, *Lil Butch*.

official AMA news

by RUSS NICHOLS and CARL WHEELEY

Changes in the new rules, the Wakefield Elimination schedule, new FAI records, round-up of latest International news, and what the clubs are doing

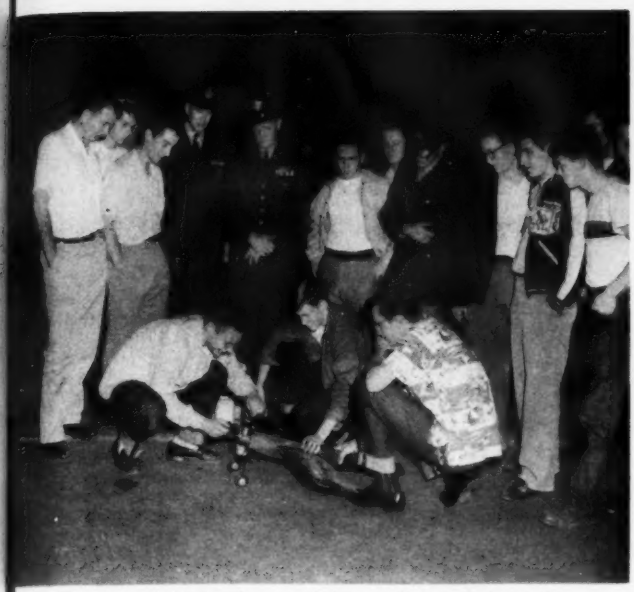
▸ *1951 AMA Rules Set.* With the aid of two ballots, the first of which was mailed in limited quantities to weed out highly undesirable proposals, the new rule changes have been set by the Contest Board. Although the changes were made last January, deadlines prevented their reprint here until this time.

For the most part, these changes won't affect model designs since there have been no alterations in wing loadings, power loadings, and cross sections. The changes though, to a great extent, bring the rules more into line with events normally run at contests. That is, some have been eliminated and others combined. The new outdoor rubber set-up, we hope, will be an added shot in the arm to Wakefield competition.

Probably one of the most progressive changes to be made is that of limiting rule changes to every two years which received almost unanimous approval by the Contest Board. Many will remember that about five years ago, rules could be and quite frequently were changed at irregular intervals so that very few knew what the rules actually were. For the last couple of years, the set-up has been to allow changes once a year, announcing them at the end of the year. Even so, many reported that it seemed as if rules were constantly in turmoil and never settled for a long enough time. Of course, with rules being up for changes every other year, there probably will have to be a clause written which will allow minor changes between regular intervals if it is found that a particular rule is just about completely

Members of the *New York Sky Knights*, who set two speed records in 1950, one in '49. Thirty-five members include a maximum of 6 juniors.

Panko brothers, Russell, left, and Rudy with newest team racers. Rudy took first at the last Nationals. Coast also flying one at a time.



Illini Liners hold Tuesday eve flying sessions in university's armory. Club is sponsored by Air Force Reserve Officer's Training Corp.

Model plane fans of the *Illini* club are aided by Capt. R. L. Collie, Air Force ROTC, here helping Jack McCann, to use a power starter.

unworkable. We'll let you know about this later.

These are the changes to the 1950 rules which will be effective this year and in 1952:

General: 1. The Official Model Aircraft Regulations may be changed only every other year. The next changes that are made will become effective in 1953. 2. The use of pure oxygen with fuels shall be prohibited. 3. Handicaps, unless approved by AMA, are prohibited. 4. Although numerous suggestions were made for determining championship awards at the Nationals, no one system has been settled on yet. The system selected will be announced in this column soon.

Free Flight Gas: No changes.

Controline Speed: 1. Models may be flown with one control line, the size of which is doubled that used when two or more lines are employed.

CO-2 Models: 1. For record purposes and official competition, this event has been eliminated.

Outdoor Rubber: 1. Previous classes are combined into two; one shall be unrestricted and the other Wakefield. 2. For the unrestricted class, there shall be a maximum time limit per flight of 6 min.

Indoor Rubber: 1. ROG and ROW classes for stick models have been eliminated.

Towline Glider: 1. Previous classes are combined into two, Class C—130 to 260 sq. ins., and Class D—260 sq. ins. and over.

Outdoor Hand-launched Glider: 1. Previous classes are combined into two; Class A—30 to 80 sq. in., and Class B —80 to 130 sq. in.

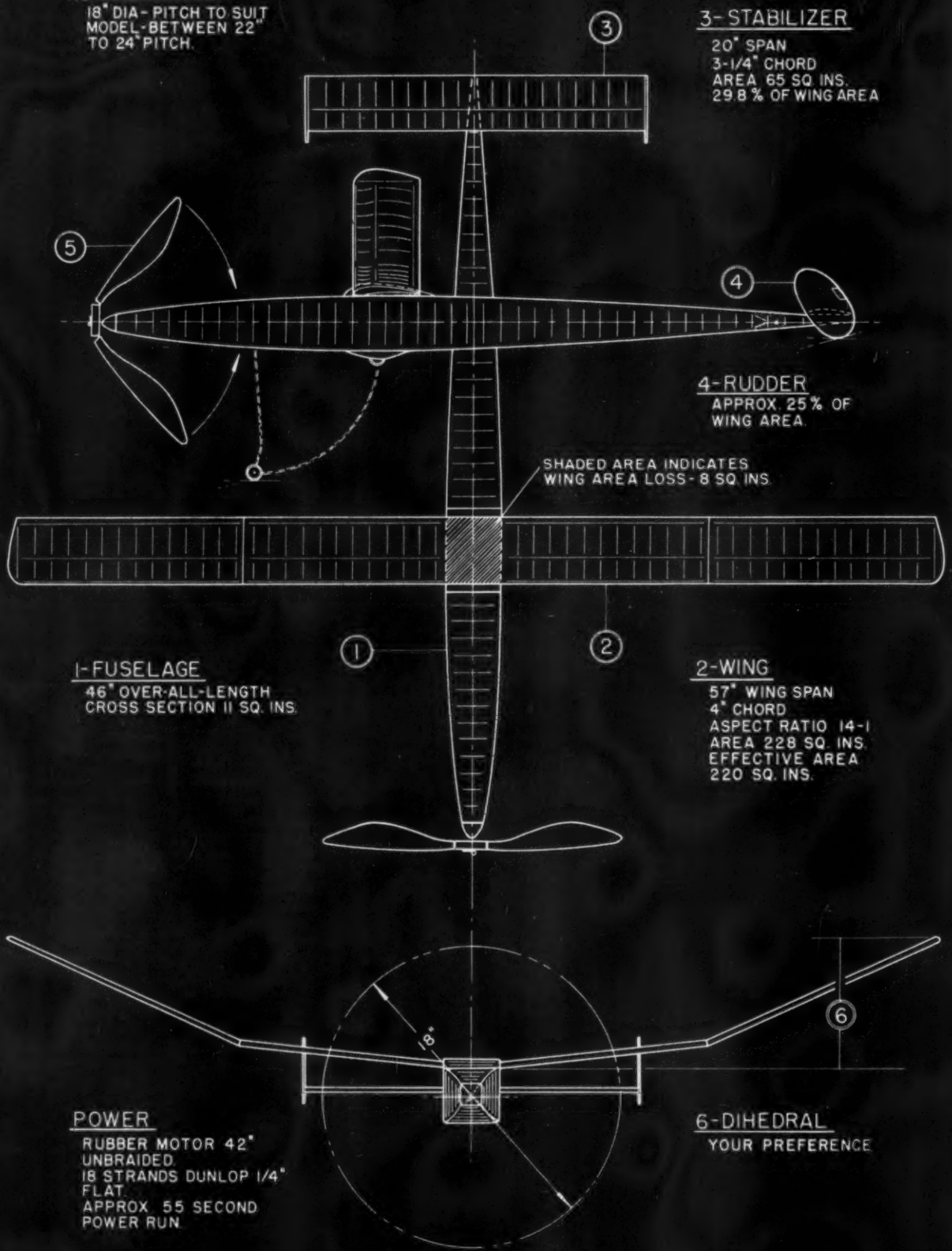
Controline Flying Scale: 1. Scale model plans of flying models appearing in magazines shall be allowed for use in judging, providing that such plans have been checked for accuracy by the editors.

Controline Precision Acrobatics: 1. "Special Maneuver" judging has been discontinued.

Wakefield Elimination Schedule. The 1951 Wakefield Committee consisting of Ed Lidgard, Chairman, William Fletcher, and Russ Johnson, has determined the procedure for selecting the Wakefield Team. This has been done with the assistance of a nation-wide poll obtaining as many opinions as possible. The procedure may seem a bit stiff to some but since the idea is to choose a team with as much potential winning power as possible, the fly-offs must be held under the same or similar conditions as the final event is held in Finland. The winners for the last few years have averaged over 4 min. and the 1950 winner has a model capable of doing 5:20 in clear, calm air. We must win in '51!

Following is the elimination procedure: 1. *Dates:* Eliminations—April 22nd, except on the East Coast where they shall be held April 29th due to a prevailing later spring. *Semi-Finals*—May 20th. *Finals*—July 7 & 8, Jami-Jarvi, Finland. 2. *Locations:* Eliminations—Portland, Ore.; Salt Lake City, Utah; Los Angeles, Calif.; Sacramento, Calif.—all supervised by Russ Johnson; Chicago, Ill.; Kansas City, Mo.; Dallas, Tex.; Minneapolis, Minn.—all supervised by Ed Lidgard; Atlanta, Ga.; Norfolk-Hampton, Va.; Cleveland-Akron, O.; New York, N. Y.—all supervised by Bill Fletcher. *Semi-Finals*—Sacramento, Chicago, Dallas, Atlanta, and Philadelphia, Pa. Two team members shall be chosen from the Sacramento semi-final and one team member each from the other semi-finals. 3. Eliminations will determine contestants who will compete at semi-finals. Those selected for semi-final competition will have averaged at least 2 min. and placed within the top 15% at their elimination meet. 4. Eliminations and semi-finals will be held rain or shine unless the weather report before flying commences indicates high wind (over 25 mph), fog, or rain (not occasional light showers). If such weather is forecast, the Contest Director will take a vote to determine whether the majority wishes (1) flying to be continued without the 2 minute stipulation or (2) a rain date be set exactly 1 week later with the 2 min. stipulation regardless of the weather. 5. Additional eliminations can be arranged if fifteen competitors can be available for flying. These contestants' names should appear on a petition to their nearest Wakefield Committee member. In this manner, prospective contestants who are some distances from an already-established elimination will not be deprived of a chance to compete. Semi-finals will not be changed. 6. Entry Fee: If the team has a sponsor for round trip expenses, the fee will be $2.50. This fee, minus contest expenses, will be used to help pay contestants' expenses to New York and back. Without a sponsor, the entry fee will be $1.00. This will defray contest expenses and any remaining sums will go into a Wakefield fund which will be duly accounted for and be used to help with the 1952 campaign. 7. No thermal flying: To simulate conditions found in Finland, flying will be done in three 2-1/2 to 3 hr. rounds with the first starting 1/2 to 1 hr. after official dawn. The 2nd round is to be flown immediately after the 1st. The 3rd round is to be completed 1/2 to 1 hour before official darkness. 8. Processing will be done Saturday night before the contest—no processing the day of the contest. In this way, processing will not interfere with flying the next morning. After (*Continued on page* 53)

FIG. 2

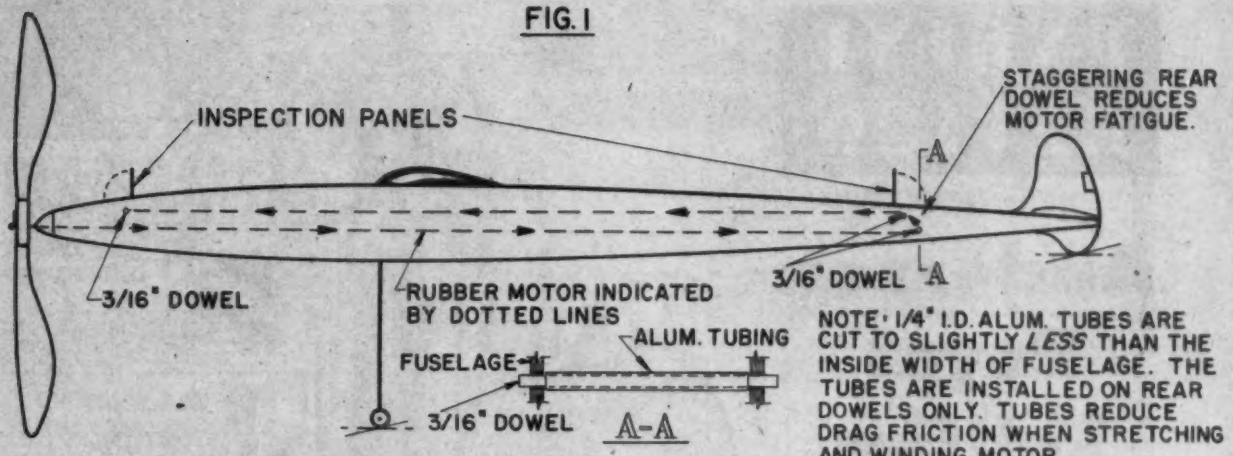


1951 WAKEFIELD ?

SCALE 1/8" = 1"

SCHROEDER

FIG. 1



DOUBLING MOTOR RUN WITHOUT USING GEARS

Nothing new under the sun? This two-motor arrangement — but no gears — increased motor runs by 35 seconds. Extremely long fuselages in '51.

we can WIN the wakefield

by CHARLES WOOD

Based on probable conditions of the finals and eliminations, these ideas got the author 5 minutes in a Wakefield

▶ The changes in the Wakefield Rules for 1951, and the unusual flying conditions encountered in Finland promise to make the most interesting and highly competitive meet in Wakefield history. Only within the reaches of the Arctic Circle with its midnight sun will you find models being flown in a contest at 2 o'clock in the morning. These flying conditions are unusual because while the sun is bright, the customary thermals and risers are almost completely eliminated.

This Wakefield Meet of 1951 then is a fair test of a model's worth in still or probably dead air. The question is, are we prepared to send over or fly models under these conditions with a reasonable chance of success? We and the other countries represented at the Wakefield in Finland last year were pretty thoroughly drubbed by Aarne Ellila and his model. Even Evans of England (Jaguar designer—'48 winner) who took second place wasn't within a minute of Ellila's time, and the English are the supposed experts at this still air flying. Our own models were proxy flown and this is a severe handicap under any conditions, but it is doubtful that they could have come close to Ellila even if they had been handled by their builders. The fact is, while these were excellent models under thermal conditions, they just were not up to this type of flying. The question now is, what kind of a model is it that wins under these conditions? To gain a few clues let's take a close look at Ellila's model and see what it is that makes it win.

Ellila's model is not spectacular or outstanding in either appearance or design. In fact it looks rather clumsy with the huge rudder, long fuselage and spindly landing gear up under the nose. The moderate sized prop is a free wheeler and there is a turbulator strip on the wing's leading edge. It isn't the tubulator strip that is the outstanding feature though. In fact it was added after the model was completed because of some flaw in wing design. The outstanding feature is that the model has an amazingly long prop run. This is accomplished by using a geared motor so that every turn in the motor is used; yet it is a powerful prop run by any standards. The conclusion is, Ellila just gets his model higher than anyone else, and takes longer to do it, and it takes that much longer to come down again. Result, he wins. Simple isn't it?

It is possible, though, that there are other answers to racking up high times under these conditions and we do not necessarily have to use a geared motor to do it. It may be that a geared motor is the only answer, but until we have thoroughly explored these other possibilities, let's not copy Ellila just to beat him at his own game. Rather let's develop our own style of model or the "American type".

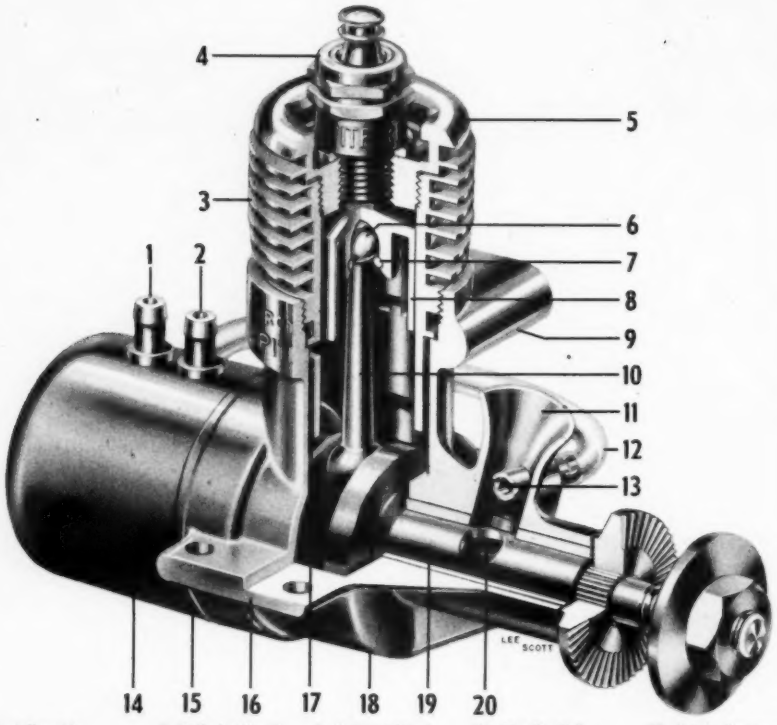
Braided motors do not seem to offer the logical answer because they are heavy, relatively low powered and very difficult to trim so they will not bunch in the tail and spoil the glide. Ellila, too, tried a braided motor in his early 1950 model and finally abandoned it because of bunching and trimming difficulties.

Our Wakefield types have long depended on a rather short, but very powerful prop run (30 to 45 sec.) followed by a floating glide to sniff out little risers and thermals. Much of the emphasis has been on the glide. Hence the folding props, retracting landing gears and generally clean models. Under normal conditions (daytime flying), these are tough models to beat as they'll pick up nearly any little riser or wind current and ride it for a long hop. But how does this model do early in the morning, say about 5 A. M. when the (*Continued on page* 50)

ENGINE REVIEW

Anderson Royal Spitfire

An outstanding addition to Mel Anderson's line of engines is the new Royal Spitfire. It's an .065 job that weighs but 1¼ oz.



1. Filler Tube
2. Vent Tube
3. Cylinder
4. Spitfire Plug
5. Cylinder Head
6. Ball Connection
7. Snap Ring
8. Piston
9. Exhaust Stack
10. Connecting Rod
11. Air Intake
12. Fuel Line
13. Needle Valve
14. Fuel Tank
15. Back Cover
16. Mountain Lug
17. Intake Bypass
18. Crankcase
19. Crankshaft
20. Rotary Valve

▸ The *Royal Spitfire .065* engines tested were picked at random from the stock room of the Mel Anderson Manufacturing Co., in Los Angeles, and were run just as they came out of the box, following the instructions. Included with each package is a Spitfire glow plug and a combination (positive and negative) glow plug clip, a fuel line and tank, a 6" propeller and prop wrench, motor mounts, and some mounting bolts. The Royal Spitfire package is complete, and the mounts are a boon in free flight.

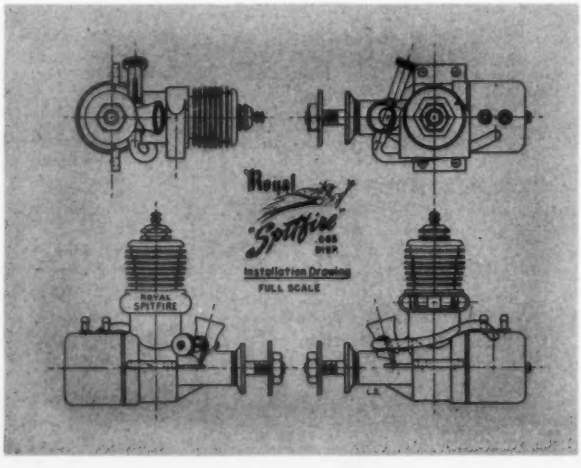
Spitzy Nitromic glow fuel, especially compounded for the Spitfire glow plug engines, was used in the test. When first revved up and tested with a strob-lite, the Royal Spitfire turned over 13,500 rpm but reached 13,800 after several tanks of fuel had been run. The engine idled down to 7,000 rpm and ran for 1-1/2 to 2 min. on a tank of fuel. The needle valve was opened 4-1/2 turns and, with a finger closing the air intake, the prop was flipped until fuel could be seen filling the tube from the tank to the needle valve. With the piston at the bottom of the stroke a small amount of prime was injected into the exhaust port, and the prop flipped again to start. When the engine quit suddenly, the valve was opened another quarter turn, the prop cranked once with finger over intake; then with finger removed from the intake, the prop was flipped several more times until the engine started.

The Royal Spitfire is a two-port rotary valve job with down-draft spray bar suction type carburetion. Both stroke and bore are .435. Beam mounting is employed. Bare weight is 1-1/4 oz. The Royal Spitfire prop is a 6 x 3-1/2 with specially designed broad blades.

Design features and construction data are as follows. The cylinder head is dural, machined from solid bar stock and screwed into the cylinder. The cylinder is steel alloy, also machined from bar stock with ample cooling fins, and screws into the crankcase. A hardened and lapped steel alloy piston is lapped to a mirror finish and individually fitted to the cylinder. The steel con rod is hardened, polished, and attached to the piston by ball-socket, permanently attached by a spring steel snap ring. The crankcase is a high pressure aluminum alloy die casting with integrally cast exhaust stack and high speed bronze main bearing.

The fuel tank is mounted at the rear of the case. Fuel feed is suction, through the rotary crankshaft valve. The downdraft carburetor has a micro adjustment needle valve for positive mixture setting. A steel alloy crankshaft, hardened and ground, has the rotary valve integral with the shaft journal. The prop drive is serrated to grip the prop and spline to shaft.

The design of the Royal Spitfire is compact, small, and powerful. Workmanship and materials are of good quality and with the proper fuels and care, the .065 should bring real satisfaction. Hobbyists who favor beam type engine mounting will find it convenient to locate the Royal Spitfire on hard wood bearers as well as on factory supplied mounts. It is easily installed on profiles, too.



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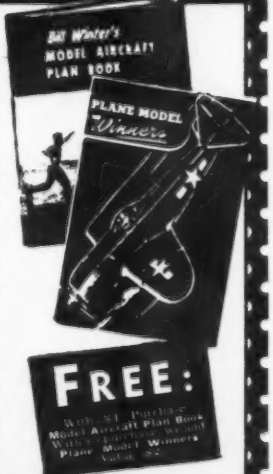

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over the counter

A monthly review of hobby developments, new items

by THE TRADE OBSERVER

▸ The Korean War is having significant repercussions in the model business. Trade observers wonder how long the present period of relative plenty will last in view of the tightening international situation. Nevertheless, the temporary confusion of last summer, and the fear to get going on new products has given way in some quarters to an attitude of let's-do-the best we can for as long as we can. New engines, kits, and a wide variety of new accessories have recently been announced, with many manufacturers holding back publicity until the Chicago Trade Show early in February. (The show will be covered in the next MAN).

Ohlsson & Rice and Herkimer, however, point up the deteriorating materials' situation. The latter is holding up three new items, one or more of which could be motors, and Irwin Ohlsson gives us elsewhere a birds-eye-view of motor manufacturers' problems.

One of the first major effects of the Korean air battle is an awakening interest in solids and scale models that has caught the industry short. Many dealers' shelves are empty. New numbers are needed. At least two manufacturers are rushing lines of detailed scale models, and the next year will see manufacturing refinements that will surely shame the best products of the World War II period. Solids definitely have a future.

Prior to the Chicago Show, your reporter learned from Top Flite's Carl Goldberg (2635-45 S. Wabash Ave., Chicago 16, Ill.) of a radically new development in simple flying models designed to do for the younger modeler — and the dealer — what the famed Strombecker type kits did in the solid line. Top Flite is aiming for the "Jim Walker crowd" with the flying equivalent of the Strombecker kits. These include the *Rascal 18*, the Piper *Vagabond* and Stinson *Sentinel*. Span is 18" in all classes.

The unusual feature of these kits is the extreme ease of assembly. No tools are required — just a tube of cement and a coffee can key for bending a wire hook. There is no paper covering or doping. A weight is furnished which is used to balance the model for flying.

Top Flite had models built by 20 inexperienced youngsters who worked under observation. The findings decided the firm on a revise of already completed plans. The structures themselves are almost self-correcting, and future models will be further improved. An advance kit put together by your reporter included a completely finished color printed balsa wing with dihedral and camber, a die cut color printed stabilizer, fuselage sides and other parts. A small plastic propeller is included for this rubber powered model.

Bill Effinger, Berkeley Models (25 Harborough Rd., West Hempstead, L. I., N. Y.) is one manufacturer who believes that the armed services and the airlines both want us to continue building models. (A Navy spokesman advised MAN they are still interested in a 1951 Nationals.) Always with something new on the fire, Berkeley has in the works at the time of this writing, an AA Payload job, called *Bootstraps*, designed by Hank Struck to sell for $2.50; a class B *Sandy Hogan* by Denny Davis for free flight; and the *Wee Duper Zilch*, by Jim Saftig, plans of which appear in this issue.

According to Irwin Ohlsson, President of Ohlsson and Rice, Inc. (Emery at Grande Vista, Los Angeles 23, Cal.) reports that further restrictions have been imposed since a recently distributed O & R letter to the trade. A recent limitation order adds O & R fuel containers to the critical list.

O & R is completing an inventory of unfinished parts and, as rapidly as the machines open up, the set-up is being altered for producing essential parts for the aircraft industry.

"We believe that there definitely will be a shortage of model equipment," stated Ohlsson, "since there are no substitutions that can be used in the parts and still maintain a high standard of quality. We have adopted the policy of not starting a run of any amount unless all the materials for the complete unit are on hand.

"Every effort will be made," Irwin went on, "to furnish what items can be provided for the continuance of model aviation, but these items will be produced in smaller quantities that have heretofore been available."

The all-steel motor mount manufactured by Air-O-Model Supply, Hawthorne, Cal., has been purchased by K & B Manufacturing Co. (224 E. Palmer St., Compton, Cal.), according to Charles R. Schaus who informs us these will be in three sizes: AA and A, B and small C, large C and D. A long thread glow plug, in addition to the familiar stan-

dard K & B plug, also is available. The mounts cost 35¢, 40¢ and 45¢ the pair, depending on size. K & B Shur Stop cut-off is 75¢; their needle valve 85¢.

We are now able to release info on K & B's new .19, held confidential since last July. It was hoped by K & B, at this writing, that the .19 would be available in March. Price is $12.95 with propellor.

Bore is .640, stroke .620. Much like the well-known 29 Torp in appearance, the 19 is 3-3/32" high, 1-13/32" between beam holes (across), and is 2-15/16" long. Fore and aft hole spacing is 1/2". Front venturi, stack left side.

E. Warren Carter (Carter Craft Models, Norfolk, Va.) has in the mill a 3/4" scale line of World War I AA jobs for both free flight and controline; parts are precut. It is expected that these kits will include plastic fittings and accessories and something new in wing design. This line should be inaugurated late in March with a 19-3/4" *SE-5* retailing at about $2.75-$3.00. Construction along the line of the firm's widely known 1/2" scale series.

Paul Guillow (Wakefield, Mass.), has a novel twist in his line of "hollow solids," in two sizes, for 10¢ and for 25¢. Fuselages assemble from die-cut blocks and sheet sides; are rounded after assembling like box. Sheet wing and tail. Tests conducted by Over the Counter indicate that the youngsters can fly these scale solids with a short string tied to a stick.

Also scheduled for trade show announcement, but previewed by this column in late January, is a $1.95 line of highly detailed large size scale models by Enterprise Model Aircraft (5107 Ave. D, Brooklyn 3, N. Y.). Jerry Brofman, who heads up the Brooklyn firm, has gone all out on a wealth of prefabricated details. Including the *F-86, F-94, F-80, F-9F, F-51* and *MIG-15*, these kits are fully carved and shaped with canopies, plastic jet intakes, die cast pilots, bombs, props where called for, noses, wheel covers. Scale is 3/8", making the Enterprise kits about 14" in span, or 1' long.

Consolidated's Artie Hasselbach also is working up an identically priced scale series, of which the *Sabre* will lead off. One of the cutest and finest flying AA control jobs in a long while is Artie's AA *Hell Razor* which features an asacue (a kind of hard balsa) wood bottom. It, too, is fully carved and shaped to sell at about $2. The original, which we examined, does 87 mph.

A revolutionary new accessory which Over the Counter predicts will make history is a line of plastic fuel tanks by Matty Sullivan (Sullivan Products, 215 W. Dauphin St., Phila., Penn.), manufacturer of wire, swivels, and snaps. These tanks really are made of nylon which, in a melted state, can be molded into virtually wear-proof parts, even auto gears. Sullivan's tank combines the wedge and the square tank, offering both their advantages. These tanks include a baffle and adjustable aluminum tubes for fuel feed, filler, and vents, all being adjustable. This unique idea permits experimentation by the modeler. As used in the tanks, the nylon plastic is slightly flexible and can be bounced like a ball without breaking. The tank may be crammed into a compartment for mounting; consequently its position may be shifted to perfect feed problems as on stunters. It is semi-transparent so that fuel level is visible and is impervious to all known fuels. Motor run may be varied by shifting the tube to fill half a tank, for example, giving 5 or 6 min. run rather than 10. Removable tubes permit bending tubes, shortening, lengthening, etc., for experiments, replacing with new tubes if mistakes are made.

Free flight timer tanks from the same material, also using tight fitting sliding tubes, allow any length of run on the ground but a slight shift in tube will cause engine in flight to run off only the fuel in a lower compartment whose duration is previously determined. The stunt tanks are in three sizes and will cost about 85-95¢. Two sizes of free flight tanks would cover needs of all four classes.

Gil Henry whose Henry Engineering Co.—Veco (2400 N. Hollywood Way, Burbank, Cal.) first made a reputation in wheels, bellcranks and horns, then went into a line of high performance stunt ships, informs us that, despite the possible effects of the defense program, a new line of AA flying scale free flights, consisting of the Taylor *Cub* (predecessor to the Piper), Porterfield *Zephyr*, Interstate *Cadet*, Rearwin *Cloudster*, Stinson 125, Fairchild 24, Helioplane, and the Lambert *Monocoupe* is being hopefully launched. The *Cub* is the first, and the others will follow barring severe changes in the national defense situation.

Scientific Model Airplane Co. (113 Monroe St., Newark, N. J.) says their Johnny Frisoli, is pushing two new Chris-Craft boat kits featuring a new one-piece *Science-Wood* molded hull. Both kits make up 12-3/4" long boats with 4" beam. One boat is the Riviera, with red painted hull, and the other is the Special with a white painted hull. Decks are printed and die-cut in one piece from 1/32" veneer and need only to be attached. Items include all hardware down to the last nut, including brass flywheel, 5 stamped metal ventilators, prop shaft and housing. There's a plastic wheel, printed windshield and die-cut balsa seats. Only assembly is called for. Powerplants include any gas engine from an .02 to an .074. Small electric motors or CO_2 powerplants may be used. Price to be announced.

Comet Model Hobbycraft, Inc. (129 W. 29th St., Chicago) has added three new models to their M series (Structo-o-Speed) at $1.00, and a new 50¢ line of this popular type. The M line now includes six models: the M-1 Taylorcraft, M-2 Piper *Cub*, M-3 Aeronca, M-4 Beechcraft *Bonanza*, M-5 Bellanca *Cruisair*, and the M-6 Ercoupe.

The new 50¢ line will be known as the K series, and the first models to come off the line include the K-1 Aeronca, K-2 Piper *Cub*, and K-3 Taylorcraft. This group features prefabricated parts, has plastic cowling and prop, all balsa Holl-O-Wing and other special features.

RANDOM NEWS:

Models assembled in our shop this month include PDQ's *Super Clown*, a flapped, larger version of the well-known Clown series; deBolt's (DMECO, Box 73, Williamsville, N. Y.) All American Trainer and Junior; and Johnny Cashburn's *Lil Bandit*. All these are excellent models and for all out stunting the larger *Lil Bandit* and *Super Clown* rank with the best . . . American Telasco, Ltd. (55 W. 42 St., New York 18, N. Y.), distributors in this country of Jetex engines, is importing E.C.C. radio products, made by Electronic Control Components, London. Well known in Great Britain, ECC puts out a variety of transmitters, relay, receiver and escapement. The receiver uses the HIVAC tube, is encased. Escapement, for either self-neutralizing or four-point work with switch for secondary control, such as motor . . . Canadian readers can obtain the British-made ED radio equipment from Model Craft Hobbies, (66 Wellington St. W., Toronto, Can.) as well as a wide variety of British and American items . . . Jasco carries the ball for rubber—as usual—with two 24" jobs pictured in recent ads. Interesting thing is the use of triangular stock for both leading and trailing edge on a sparless wing. Works fine. Jasco may come up with 6 and 7" wide blade rubber props from plastic in the near future.

News of Modelers

PEN-PAL SEEKERS: Peter Metcalfe, 2 Kinkby Drive, Sale, Cheshire, England is seeking a correspondent between 16 and 18 years old . . . Jack Kalterjahn, 310 14th St., Oshkosh, Wis., would like to correspond with someone who shares his interest in AA's; he wants to exchange an Ohlsson 23 for a McCoy 9 or an O. K. Cub .074.

EXCHANGE MOTORS: Don J. Lanoue, 5028 N. Walnut, Spokane 12, Wash., would like to trade an English E. D. Bee .061 diesel for an AA engine, a Bullet or a Torpedo engine . . . James G. Schenck, 614 Ridgefield Ave., Pittsburgh 16, Pa., has the following engines which he wishes to exchange for Madewell 40's: Viking Twin, Ohlsson 60, Super Cyclone, Arden .09, McCoy 29.

? READERS

NAME *YOUR* PREFERENCE

Every reader of MODEL AIRPLANE NEWS has his own ideas of what should be featured in the magazine. Here's your chance to speak out—just mark your preferences below, clip out this ballot (or copy on another sheet), and rush it to our Editorial Office at 551 Fifth Avenue, New York 17, N. Y.

1. Write (1) after feature you like best, (2) for the next and so on. Cross out those of no interest.
   - (a) Scrap Box .....
   - (b) Report from the West .....
   - (c) News of Modelers .....
   - (d) AMA News .....
   - (e) Plane on the Cover, Boulton Paul III .....
   - (f) Engine Review .....
   - (g) Airways .....
   - (h) Nieto WWI Scale Drawings .....
   - (i) Design Details .....
   - (j) Hobby Counter .....
   - (k) The Fabulous F4B-4 .....
   - (l) Payload Comes to Controline .....
   - (m) How to break in an Engine .....
   - (n) Sure Fire .....
   - (o) Plane in the News .....
   - (p) Wee Duper Zilch .....
   - (q) We Can Win the Wakefield .....
2. I am interested in: (cross out those of no interest)
   - (a) Stunt
   - (b) Free Flight
   - (c) Speed
   - (d) Rubber
   - (e) Gliders
   - (f) Free Flight Flying Scale
   - (g) Controline Flying Scale
   - (h) Design Articles
3. I would like more full scale material. Yes..... No.....
4. I am ..... years old.
5. I subscribe to MAN. Yes.... No....
6. Please add your suggestions.....

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Planes in the News

(*Continued from page 25*)

claim for his unarmed Dorniers and Junkers —and what happened then. Even though the problems of interception and gun-laying and combat are different at high altitudes than they are at low, the claim of evasion by outmaneuvering still seems pretty optimistic.

Anyway, the Canberra is fast—plenty fast. And it's amazingly agile, too. At last fall's Society of British Aircraft Constructors Show at Farnborough, Wing Cmdr. Beamont whipped the black-and-gray craft around within the confines of the field, which probably meant a turning radius of under half-a-mile. And that's right good for a bomber, even one that's nearly empty.

Comet, De Havilland's well-known four-jet transport, makes the engineering news circles again with the announcement that there is a more-powerful version in the mill. Although everyone took for granted that the Comet was to bolster Britain's position in trans-Atlantic service (and DH never took the time to point out otherwise), it has finally been formally announced that the present Comet is definitely not intended for non-stop crossings.

Engines for the new Comet are reported variously as axial-flow Avons or Sapphires. There is an even chance that by the time the plans are completed, DH could have an axial-flow turbojet of their own. And then the Comet would still be an all-DH job.

Second prototype Comet was to start route-proving flights with a British Overseas Airways Corp. crew this spring; third plane, first production craft, is due for summer delivery to BOAC.

Boulton Paul P.111 is the second model of three different British delta-winged research aircraft to fly; by the time this appears, the third should have flown also.

First of the group was a quickie-design, the *Avro 707*, built around every possible short-cut to get the plane in the air. It splashed shortly after the 1949 SBAC show, at which it had made its first public appearance. Avro's second ship, the *707B*, was a slightly modified version. It flew first just before the 1950 SBAC spectacle.

Boulton Paul's job took to the air late in 1950, powered by a Rolls-Royce Nene which delivers about 5000 lb. static thrust at sea level.

Third of the series is a Fairey design, on which no details are available currently.

Span of the P.111 is 33′ 6″ and the overall length is 26′ 1″. Wing and fin tips are detachable for studying the effect of clipped surfaces on flight performance. Performance is probably transonic. In the first place, the delta-wing shape is at its best in the transonic and low supersonic regime. In the second place, one Nene without afterburners or rocket boost just isn't powerful enough to get the plane too far over the drag hump.

Ouragan (Hurricane) is France's best post-war effort in the aircraft field. The chubby interceptor, currently in quantity production at the parent factory of Marcel Dassault and several other French firms, is to be one of the perimeter defenders of Western Europe. In this role it is expected to supplant the current squadron equipment of De Havilland Vampires.

Those who have bewailed the indifference of the French in girding for defense might have a look at the record: the first prototype Ouragan was wheeled out for flight trials six months after the order had been placed. And the prototype order for three soon was increased to 750, current production commitment. Powerplants of the early versions were Rolls-Royce Nene turbojets, but production numbers probably will contain the Hispano-Suiza-built Nene.

Rate of climb is the specialty of the house; *Ouragan* starts upstairs at about 7800′ per min. and at 30,000′ is still going up at close to 2000 fpm. It can blast along at 600 mph on the deck, and at 30,000′, still do 535. It's a light airplane as fighters go—12,300 lb.—and fairly small. Wingspan is only 37′ 2″; length 32′ 7″; wing area is 257 sq. ft., a little more than the Grumman Bearcat, which was a marvel of compactness.

Current status is that the first production airplane has flown and should be by now in the hands of the French Air Force. A swept-wing variant, the Dassault 452 Mystere was being readied for first flight early this year.

At first glance, the little plane looks awkward with its narrow-treaded gear, barrel-like fuselage and upswept tail. Second glances show the thin wing set way back, and the excellent visibility for the pilot. And third glances, particularly when it's in the air, make it a fairly handsome beast.

This Hurricane may be to France what another Hurricane was to Britain.

Fairchild T-31 has won itself an Air Force order and probably touched off a lot of undercover argument. Originally the plane was a prize-winner in an AF competition for a basic trainer. Then plane procurement suffered for lack of finances, and the Fairchild job didn't appear again until the fall of 1950, when the Air Force and Navy decided to sponsor a joint evaluation of trainers.

Basic purpose of the evaluation was very idealistic. Theoretically, the AF, Navy and even our allies were to agree on a trainer for every body. The Canadians sent down a De Havilland Chipmunk, long since the standard trainer for the RAF Reserves. Britain sent over a *Boulton Paul Balliol*, the RAF standard trainer with Spitfire performance. Temco, Beech and Fairchild represented the U. S.

But somewhere along the line the competition was first halted, and later nullified by the withdrawal of the Air Force. Then, AF announced an order for the T-31—but what a different T-31! The "new" trainer will have tricycle gear instead of conventional; a Lycoming flat engine instead of a nine-cylinder radial; a longer, broader wing. And it will be a heavier airplane.

Other manufacturers should be quick to point out that, given a chance to revise or redesign their entries, they too could produce a satisfactory trainer—if any of them knew what a satisfactory trainer was supposed to look like. The Air Force never told anybody—they said in effect, "Build a trainer, and if we like some of its features, we'll specify that they be used in setting up trainer specs." So, several firms built trainers, only to find out that the evaluation had not exactly been impartial and fair. It can be asked why we should have to train fledglings in the biggest, heaviest and most expensive machine we can find.

Piper Cub for 1951 bears the appelation of Super Cub, and the only thing super about it seems to be its take-off performance. Otherwise it is the same old Cub design which has been coming out of the doors at Lock Haven, Penna., for a generation. You can buy the Super Cub 95 with a 90-hp Continental or the 125 with a 125-hp Lycoming. For another hundred bucks you get a metal prop on the 125, which means the take-off distance goes down to a couple of hundred feet, or about 500' over the 50-ft. barrier.

This plane has been okayed for hauling people or insecticide or dust. And to forestall any howls from the Pennsylvania hills, it's a good plane, just like any other Piper.

Ag-1 Agricultural plane was designed solely for feeding, seeding, spraying and dusting. It was developed and built in the record time of

one year at the Personal Aircraft Research Center of Texas A. and M. under the supervision of Fred Weick, best known for the Ercoupe.

Fuselage is slab-sided and features an exceptional field of view. There are external stiffeners which run from the firewall to the rear of the cockpit. These, and a rugged overturn structure should provide unparalleled safety in a crash. Spray tanks are stored in the 21-percent thick wing, and spray nozzles festoon the undersurface. Span is an even 39'; length is 29' 8"; height over cabin in three-point attitude is 8' 7".

Collectors of aeronautical data have probably noticed by now that the Canberra three-view can be cut out and pasted on a standard 6x8 file card. This is going to be repeated each month with at least one plane.

Modelers who would like to try something a little different this month are referred to the *Boulton Paul P.111*, which should make a honey of a free-flight job with Jetex. You could get transonic scale speeds, too. For controline fiends, how about the *Ag-1*? It looks ideal for anything from a goat to an acrobatic wonder. And for a final touch, how about building in a way to spread talc overboard just like the real ship dusts crops? Rubber fans could try the *Ag-1*, or they could repaint last year's Cub model and call it a '51. That's the nice thing about building models of the Piper series—they never get dated. Scale builders could do no better than the sleek *Canberra*. Its gray-topped, black-bellied color scheme and its smooth lines make it a showpiece.

Scrap Box

(*Continued from page 5*)

the Finnish lad with his long geared-motor run. The Wakefield rules say nothing about flaps. Let's stick Fowler flaps on them! Should get another 75 sq. in. for the glide!

Towline: There has been nothing new in American towliners since before the war, since Hank Struck's "golf stick" launching method. Our solution to the on-tow aerobatics of so-so designs is an off-the-centerline tow hook. In Europe, stability studies have been carried so far that it is possible to fly a dihedral-less and sweepbackless wing, although this is the exception rather than the average. The continental countries developed years ago a novel profile with a deep nose shape, almost like a blob when you view it from the side. As a few of our experimeters coincidentally discovered in trying to check certain design ills, those odd profiles appear to be the end product of years of experience. This last year the steel towline came into its own abroad, with the flier playing the machine high overhead until the lift of a thermal could be felt down the line. Some ships remained on tow for 5 min.

It is appalling how little knowledge we have of airplane shapes in relation to lateral stability. We argue endlessly over things like c.l.a., never settling an issue, and produce, as in free flight, airplanes that are, and have been, dangerously unstable for over a decade. No modeler in the world is as smug as the American modeler who resists anything that looks different. The writer should talk!

Last week-end we made the acquaintance of whip-control. We had asked the dealer what was good for one of the younger members of the family and, with a glint in his eye, this character pulled out a kit which made up into a profile *Mustang* or *Airacobra*, by Jim Walker. As most of us know, the lines run to a fishing pole, then to the handle which you hold in one hand, while making a "casting" launch with the other. As the ship begins to whirl around you, more line is paid out. The dealer had said, "You haven't lived until you have tried this." Indeed, we hadn't.

After its young pilot had made several wild circuits ending up on his back each time, we gave him the benefit of experience (?) on ice, too. It's easy to get started but that *Mustang* out there hums in the wind and goes like a bat out of you know where. Make it loop, yells the small fry. Up elevator, and the *Mustang* disappeared. Wham, right in the seat of the pants. This brought down the house. Such dare devil flying, such finesse. Science marches on.

by BILL WINTER

REPORT FROM THE WEST

by Jim Saftig

Les McBrayer, one of the stalwarts of the *F.A.S.T.* Club, sends some interesting information. Les tells us that the *F.A.S.T.* Club (First All Speed Team) is planning a big year for 1951 with several new ideas and events. Pilot Keith Storey has retired the beautiful Dash trophy by winning it three times so a new trophy will be set up. It is very likely that one of the new pieces of hardware will be given for fuel economy; it will be given to the pilot of the plane making the highest number of laps in the ten mile race. The heat races for 1951 will consist of one 7 lap, one 21 lap, and one 70 lap race. This is to give the slower, longer running models a better advantage and will discount the advantage of top speed. There will be two 10 mile (140 lap) races; a special race for F.A.S.T. Club members; and the main event for non-F.A.S.T. Club members. Also a completely new event will be started for team racing models, flying one at a time; more on this when we have more definite rules. The first team racing contest of '51 was scheduled early last February.

A few Sundays ago at one of the club's races, Les had the misfortune to splatter (but good!) his *Highlander* team racer but had another very sharp ship to take its place. McBrayer has built a series of the Highlander models, the last one being number five in the series. A new one is in the building stages at the present time that will be much lighter than all previous ships. It will have a more rugged fuselage structure, and will incorporate a new type cowling for better cooling and easier accessibility. This model will be powered with a McCoy 29 mounted on an aluminum crutch along with a choke-off engine shut-off device and the tank. The whole unit is quickly removable for servicing and the 110 mph marker is the goal of this new little beauty. Still another newer ship is on Les' drawing board which will be of completely new team racing design and will be called *Fast Stepper*. This ship will have an elliptical wing, mounted shoulder high, elliptical shaped tail surfaces, inverted McCoy 29 engine, turned fuselage plotted from the *NACA* 009 airfoil, and will be smaller and lighter than the *Highlander*. The fuselage will be split full length on the thrust line and held together with two bolts. Only the landing gear and tail skid will be mounted in the lower block. Experience has shown that the cowl, underbody, and landing gears of a team racer usually absorb the most beating. This type of construction will allow easier replacement or repair of these vulnerable parts. In addition, such a set-up will facilitate the building and testing of retractable gear pulling up into the fuselage. This ship should be in the air very shortly.

The beautiful Burton Wood Trophy donated to the *Western Associated Modelers* by Mr. Burton Wood, was won by both the *Martinez Aero Modelers* and the *Pittsburg Cloud Busters*. Mr. Wood, a member of the *Pittsburg Cloud Busters*, decided that the *Martinez Club* would hold the trophy during the first quarter of 1951 and that the *Pittsburg Club* would hold the trophy during the second quarter. The next award thereafter will be at the *W.A.M.* meeting in July 1951, to the winning club for the first six months of the year. The rules for competing for this award are as follows: I. Competitive periods shall be the first six months and the second six months of each calendar year with the awards to be made at the W.A.M. meetings held in January and July. 2. The award shall be a club award based on points won by the club during the six months period. Winning club shall be responsible for the engraving and cost thereof of simple straight line printing of the club name and

date won. 3. Club points shall be awarded as follows: One point shall be awarded to a club each time that a novice member of the club or a beginner member of the club posts an official score in a novice or beginner event at a W.A.M. sanctioned contest. Attempts with no official score shall not be counted. Where two official flights are made in an event only the best flight is the official score. 4. Maintaining a record of these novice and beginner club points shall be added to the duties of the Association Recorder. A copy of these records are presented to Mr. Wood prior to each semi-annual award of the trophy.

Bob Brown of Coronado, California, had a rather unusual experience that left his face a very brilliant shade of scarlet. Bob bought himself a pontoon kit for his old *Comet Clipper*. Brown decided to take his plane out in his 14' outboard powered skiff and try some bay landings. After firing up the Atwood 60, Bob was ready to launch; the boat was under way, then things began to happen. Bob forgot he was in a skiff, stood up, and, while the skiff was still under way, took three steps forward, and tried to launch. On the third step our hero dropped into the drink, and just as the water swept over his head, launched his ship. The skiff was under way, the model plane was under way, so Brown got under way. After three or four efforts to grab the gunwale of the circling skiff as it went by, Bob finally made connections and climbed aboard. But the timer had stuck and the ship took on about 800' of altitude before the engine finally cut. A long dripping-wet chase through the bay sloughs followed only to see the ship hook a thermal and disappear. A week later Bob got his ship back, learning that it had landed down by the Border Airport some 16 mi. away. Needless to say, Bob learned how not to launch a float job from an outboard skiff.

Ced Galloway, co-owner of *Galloway's Hobby House* with his wife Lee, is now working at Lockheed Aircraft. Lee runs the shop in Ced's absence, and Ced helps out after work. Ced Galloway is the lad who builds the slick scale jobs. We have seen his famous *F4B4* fly on many occasions and have had the opportunity of seeing several other beautiful ships on display in his model shop, as well as making very fine flights in the U-control circles.

Jim Walker has fixed up a portable lighting plant for night flying. The lights make it possible for Jim to teach the youngsters to fly in the evenings even though the locality may be a bit remote.

The *San Diego Airliners* entertained the children of the St. Nazareth Orphanage with an air show January 14th. The Airliners have been entertaining crowds at fairs, jalopy races, and other sport functions. Cliff Potts, Harold Ledington, and Bill Alford, three of the mainstays in the club, have scheduled several more shows for '51.

Lew Mahieu is now working for K & B Manufacturing Company. Lew is one of the top speed and free flight men in the country. At one time Mahieu held all four speed records at one time plus all or nearly all of the R.O.W. records. We always think of the *Zeek* when our thoughts turn to Lew. This ship has been winning much hardware for the flyers in all classes.

The *Junior Museum of the San Francisco Recreation and Park Department* started holding model airplane contests in 1938, and since that time has kept a record of all the winning flights in each event. Each year new records have been established, and 1950 was no exception. In the past twelve months four members of the *Pterodactyls* have set seven new club records.

The Junior Museum is responsible for an excellent program in helping the youth of that area learn and apply the fundamentals of model flying.

It has been rumored around that the *Nevada Aveites Model Club* may be getting together again to stake another of its very successful U-control meets. We remember one of the last big contests the *Western State Aveite* meet held at Cashman Field in Las Vegas, Nevada. It was here that A. W. "Shorty" Wright of the Aveites showed his heels to the rest of the contestants. At this swell contest, the Veterans of Foreign Wars went all out to help the lads stage a contest second to none. Ralph Wilson handled the Contest Director duties. Are the rumors well founded fellows?

Sure Fire

(*Continued from page* 18)

set, add the bottom sheet. Cement it in sheet form, and trim it to the sides, rather than cutting a pattern and then trying to fit the pattern to the fuselage. By using a sheet, any discrepancies on the fuselage or plan will be eliminated as you trim to the actual outline.

The front bulkhead has the usual 1/16" plywood and balsa sandwich construction, with wire landing gear sandwiched between the two 1/16" plywood bulkheads. Be sure to be generous with cement on the front bulkhead junction, as it has to take punishment caused by an unbalanced prop or rough engine running at high speed.

Cut pylon from 1/8" sheet balsa and cement it in position. Check to make sure that it is straight. An offset pylon can be just as bad as an offset rudder. Two pieces of trailing edge stock are cemented to the top portion of the plyon to strengthen the structure. Top platform for the wing is cut from 1/8" balsa and cemented in place. To this platform add two 1/8" squares, one on each side, to provide a spaced support for the wing.

The stabilizer platform is cut from 1/16" balsa and cemented in place. Add the top keel from stabilizer to pylon. Secure the keel in place with a few triangular bulkheads as shown on the plan. Sand the entire fuselage smoother with a good grade of fine sandpaper. Go over all edges to produce a smooth finish. Re-cement any joints that may have been weakened in the process.

The wing can now be started. Carve the leading edge to an approximate shape as shown. Pin it over the wing outline. Cut the wing ribs from 1/16" sheet balsa. Position the trailing edge with pins, and start cementing ribs in place. After the individual panels are assembled, cement them together so that the proper dihedral angles will be obtained. Sand leading and trailing edge to bevel to obtain correct dihedral. While the dihedral joint is drying, and wing is still held in position with blocks, add 1/16" sq. spars. These spars are used only to form rib stiffeners. The tips are now added. These are carved from soft balsa as shown on the plans. All dihedral joints should be covered top and bottom with bandage. Spread ample cement over the bandage before covering. The leading edge now can be sanded to conform more exactly to the rib shape. Do not sand ribs as you are liable to produce a flat portion between the 1/16" sq. strip and the leading edge.

The stabilizer is made in a manner similar to the wing. However, it has no dihedral nor 1/16" sq. stiffener strips. You will notice that there are two ribs at the center. The reason for this is to provide a sandwich-like construction for the 1/16" rudder attachment. Be sure that these center two ribs are cemented perfectly straight as they determine the rudder setting on the model. An offset rudder may make it hard to fly properly. Carve the tips in the manner described for the wing. The stabilizer airfoil is similar to wing, and the ribs are obtained as the tapered ribs on the wing tip. To finish the stabilizer, sand it smooth and make sure that the ribs line up well for smooth covering.

The rudder is cut from 1/16" balsa, quartergrain preferred, sanded smooth, but not to a streamlined section. Just round the edge. A 1/16" balsa rudder when streamlined, produces very thin and ragged edges after a few weeks of flying. Be sure, when cementing the rudder between the two center ribs on the stabilizer, that its position is as straight as possible.

Covering. The entire model is covered with Jap tissue or any similar tissue of light weight. Starting with the fuselage, cover the entire model, including the balsa sheet portion. This will seal all pores in the balsa and require less dope, keeping the total weight to the required minimum of 5 oz. Wing and stabilizer also are covered with tissue. Here, be sure to add a little bit of castor oil to dope if dope has a tendency to excessive warping. Dope the model thoroughly so that it will not be able to absorb water. If a model is doped well, warping may vary. That is, in the morning, while test flying, as we do on a contest day, the grass may be wet, and the model will pick up moisture. Adjustments made at this time are false. When the sun comes out, the model will never be the same as in the morning. Therefore, any flight you may make in the morning, may or may not be repeated in the bright sunshine.

Trim (decorate) the model to your own taste. Many people may be too busy and rush or forego this part. However, a bit of *Trim Film* will make the model more appealing later on.

Flying. We could sit down here and tell you many ways in which this model should be adjusted. Or we could say that no adjustments are needed. That is not true. Glide the model in a straight forward launch. If there is a slight stall present, all is well and good. However, if the model is slightly diving or even has a fast glide, add a little clay or similar weight at the tail end of the model to produce a slight stalling condition. Here, with this stalling condition, any turn that may be present during the first few test flights, due to offset motor or wing or bent rudder, will not give the usual spiral dive but a spiral climb, ending in a stalling glide. This is a lot safer in the long run. This stall in a glide can be slowly taken out by tilting the stabilizer.

Tilting the stabilizer is not new. Viewing the model from the rear, the lowest tip of the stabilizer in relation to the wing will be on the outside of the natural glide turn. To produce this tilt, a small sliver of balsa

or similar material can be slipped under the opposite side, a little at a time, flying the model between the adjustments until the desired turn is obtained under power and in the glide. A safe tight turn is very necessary for thermal catching.

Before launching the model into a breeze, if there is any, let the engine run for 4 or 5 sec. Do not fly the model once or twice, but keep on flying and flying. If the weather is calm, wait a while before going home until the wind comes up, and then fly and fly again. Be sure the model is flying the way you want it to fly, not the way it wants to. The model is supposed to climb in a right circle and glide to the left. But, if your model flies to the left and glides to the right, and it does it well and continues to do so flight after flight, leave it to fly that way.

After flying this model many times, and having test-flown it to your satisfaction, take it to a contest, and don't worry who is there. At the end of the day, they'll be watching you when you takes the prizes home.

We Can Win the Wakefield

(*Continued from page 36*)

grass is wet with dew and the air is chilly although the sun is just coming up? Don't be fooled by those still evening air hops. There is still a lot of heat left in the ground after the sun goes down. Remember, a little thermal can make a model look awfully good. How does your model do in the early morning? Can you still get those four and five minute hops? If you can't, you won't get them in Finland either.

The answer seems to be, get higher, higher than we have ever put a rubber model before, so high that it is just a speck in the sky when it stops climbing. If we can do this and still keep a nice glide, preferably in wide circles so that drag is at a minimum, we'll have a good chance to get the trophy back here.

One solution to this problem seems to be to use an extremely long fuselage for more rubber length. This isn't my own idea by any means. The Italians are already experimenting with fuselages up to 5′ in length. Under the old rules the cross section would have been prohibitive, but now under the new rules you can use a fuselage 20′ long if you want to and the cross section has to be only 10.075 sq. in. regardless of the length. The Italians' theory seems to be to get a tremendous prop run (perhaps even 3 min.) and forget the glide. The model will get so high it will take a minute or so just to fall back to the ground.

The English seem to feel that two models will be necessary—one ordinary model for the eliminations and a special model for the Wakefield. This is another possibility, although it seems that one model is enough of a problem to contend with.

What Ellila will do is hard to foresee, but it is doubtful if he will deviate much from his basic layout. After all the model has won two Wakefields for him. His ship will probably be modified and cleaned up somewhat and he'll probably keep hitting around 4 min. He does have one big advantage over us in that he can closely check his times under the same conditions as the meet will be run. We to do the same thing have got to get out early in the morning (just after the sky gets light). This is about the only way we can check performance under approximately the same conditions that will be found in Finland.

As to the layout of the model, a couple of thoughts come to mind that might be worth perusing. One is to use a model much along the lines of our previous Wakefields only the motor will be twice as long as formerly (see fig. #1). This will require a rather deep, but thin fuselage and one that is strong. Rubber will double back over dowels and still be effective although it will be hard on the rubber. You'll probably have to change motors between each flight or stand the risk

of breaking one. Most fliers at the Wakefield change motors between each flight anyway so this shouldn't be too tough. Of course, the weight of the model is going to go up no matter what you do, but by keeping the wings and tail light it should come in at around 9-1/2 to 10 oz. I've made bench experiments with this type of a motor, and it seems to work without a hitch, the motor run being increased from approximately 35 sec. to over a minute, and it is just as powerful.

Another possible solution is to use a model that is elongated on all surfaces (see fig. #2). The fuselage would be longer (about 46" overall length), but the wing and stabilizer would be proportioned to the fuselage. This model would use only about a 30% stabilizer and the area saved on the stabilizer could be put into the wing to decrease the wing loading a little. A 30% stabilizer is quite effective if you use a long tail moment arm. Under the new rules (263.5 sq. in. minimum, 294.5 sq. in. maximum gross areas) you can use as large a stabilizer as you want, (cutting down on wing area) or as small a stabilizer as you want (increasing the wing area). Therefore there is room for every designer to use his own pet theories on relationship of stabilizer area to wing area. Now too, you can mount the wing flat on the fuselage and cover it over (and lose that area that rests on, or runs through the fuselage), or mount the wing pylon style and not lose any area exeept that which is lost by the drag interference around the pylon mount. So there is really more leeway under these new rules for every designer to express his individuality.

It seems reasonable that these models will be just as good in thermal weather as in non-thermal weather. It doesn't seem necessary to build two models for the eliminations and the meet itself. One good model ought to be effective in either contest. There is still a 5 min. flight rule and a long thermal hop will only mean that you will probably lose the ship.

R. H. Warring made the comment that "models which do well under thermal conditions are not necessarily good still air models." But we can turn this around and say that good still air models (provided they are reasonably high powered) are good thermal models too.

Many modelers who are rather unexposed to *Wakefield Fever* ask, "Why all this fuss just about an old rubber model contest anyway?" The best answer that can be given is this. It is the toughest contest in the world to win. When you compete in a Wakefield (and most of us never get that far) you are up against the best brains of rubber modeling in the world. All the six man teams, the best in their respective countries, gathered together at one international meet, pitting their knowledge and skill against each other to win a cup. Yet it is more than just a cup. It is the *Olympics* of model building, a symbol of international friendship and competitive spirit and when you win it, you're the best in the world. That's why many of us rack our brains each year for the answers to a winning model, and it is the reason that we go back and try again when we don't even make the team.

Sure the Wakefield is tough. It's meant to be. It is one of the few free flight contests where the luck element is almost eliminated. It's flown off in rounds so that each man gets a fair chance whether the weather is fair or foul, and if one contestant is handicapped by poor conditions, the others are too. It isn't like so many contests where the hot shots hang back until the sun comes out, and then rush madly up to the contest director and plead to fly so they can hook a thermal and continue to be hot shots. You fly when your turn comes or you don't fly at all. Neither is the Wakefield a contest where the fellow with a car full of models wins all the trophies. You have one model, and that is the model you win or lose with.

The Wakefield is tough, but it is fair. It is a heartbreaker at times; yet it encourages all, and brother if you're good, you've got to prove it by doing it, not by saying it.

Design Details

(*Continued from page 30*)

propellers, counterbalanced for smooth running, often yield fine performance if blade area is adequate. Three-blade props tested by the writer, no matter how carefully made, produced less thrust although they ran with great smoothness and were easier to crank. Four blade props fall off even further in thrust—at least in model use where high speeds are common.

Experiences by the writer with a version of Jim Walker's slow motion propeller proves beyond any doubt that this gadget has real promise other than Walker's initial use as a training aid in controline flying. Consisting simply of a metal, short-bladed propeller bolted in front of and at right angles to the regular propeller, the device is twisted to slight reverse pitch. It neutralizes whatever portion of the thrust the particular type of flying requires. We used it successfully in slowing a radio control ship. Torque and steady high engine speeds were retained and the thrust was reduced as desired. Walker's invention could prevent many free flight test mishaps by the reduction of the negative twist on succeeding flights until adjustments were perfected when it could e removed altogether.

Most speed flyers trim down stock propellers. They often accept the helical pitch of the back (actuall it is called the "face") surface then alter blade width, thickness and shape, and give special attention to hub areas where the machine cuts often leave room for improvement.

Here are very generalized pointers for beginners as to prop styles used with various model types: Free flight—moderate blade area, low to medium pitches; Stunt—wide to paddle-blade styles, low pitch; Team racers—moderate blade area, medium pitch for acceleration; AA free flight—small to medium blade area, low pitch due to high engine speeds; Radio control—varying types to achieve desired speeds (lower pitch for heavier ships, higher pitch to prevent hanging in stalls); Speed—small, thin blades, high pitch; Payload models—moderate to large blade area, very low pitch.

Manufacturers nowadays provide us with great variety in ready-made propellers at low cost; the problem simmers down to that of learning precisely which prop to select for a given model type.

Wee Duper Zilch

(*Continued from page 27*)

each side of the center section at the bellcrank point and drill hole for crank. Lightly sand all rib joints at the leading and trailing edge until they fit smoothly. Round out the leading edge to proper shape along the trailing edge. Don't sand the trailing edge too thin—leave 1/16" at the trailing edge. Trim 2 end ribs down 1/8" on each side and shape to leading edge and trailing edge. Form the tips and sand them to shape. Hollow them out well (if one weighs a bit more than the other, use the heavier one on the outboard tip) and glue into position. Sand them down until they exactly fit the cut down rib section at the tips. Install the bellcrank, making sure the aft ear is bent slightly down, as per drawing, so it will clear the push rod. Add the control lead-out wires after installing 1/16" I.D. tubing at inboard wind tip. Work this control until you are satisfied that it is very smooth. This is very important. Trim the center 4 ribs down 1/16" and apply the balsa 1/16" reinforcement sheets on each side of wing. Sand this down thoroughly and apply one coat of sanding sealer. Give the top and bottom of each rib a light coat of sanding sealer, then sand lightly with fine paper. The wing is now ready for covering.

Choose a color that you like and either dye or buy the color Silkspan you prefer and cover the wing. Apply 4 thin coats of dope, then apply 5 medium coats, making sure the paper is filled. (The original Wee Duper was completely covered with dyed silk.) Cut out

the stabilizer and elevators and work them down to a smooth finish as per plan. Add the tail horn and wrap and glue it in place. Cover this assembly with the same color Silkspan (or silk) as the wing after the tape hinges have been doped in place. Make sure the elevator operation is very free.

Trim out the 3/16" sq. piece of balsa at the rear of the fuselage for horn and push-rod clearance. Hold the finished stabilizer in place and take a sight on it to make sure you have clearance for push-rod and horn.

Trim out the fuselage sides per template for the wing insertion. Trim out a little at a time until the wing slides through snugly. Check to see if the wing is centered and lined up all the way around, then spot glue and wait till it is dry. Check again to see that everything lines up; then glue in permanently. Run a bead of glue around the outside of the wing where it joins the fuselage and glue as much of the inside as possible. Glue the stabilizer in position, making sure there is clearance for the elevator action. Dowel to the reinforcing block underneath the stab with two pieces of 1/8" dowel. Trim out reinforcing center section of wing over bellcrank. Line up push-rod per plans and cut slot in wing center section for rod clearance, then install push-rod. Cut out top of fuse and hollow out. Add fuel tank as per plan. Cut out cockpit and trim for stabilizer clearance and glue in place. Sand smooth and add sanding sealer; then sand out and apply paper covering. Add sealer and dope till smooth. Add headrest and cover with paper. Smooth out all contours. Block out engine cowling per plans and sand to shape. Sand smooth and apply paper dope and sealer. Cut rudder out and set in as per plans. This too is covered with paper and sanded out to fine finish.

Paint and trim ship to your own specifications; add fuel proofer, and install engine. The ship was flown on 35' lines of .006 wire. Test flying was very good with the Cub .099 using the 7-4 Power Prop. Longer lines can be used with the .099 power plant, but it is suggested that you don't use over 35' lines for the .074 or engines of similar size.

Official AMA News

(*Continued from page* 35)

processing, where each part of the model will be identified by a decal, stamp, or stencil, models will be impounded. Second models will also be processed Saturday night and be impounded until proof of need is shown. 9. Order of flying will be numerically determined by a number drawing taking place Saturday night. No excuse will be valid for absence when called to fly. 10. An affidavit verifying knowledge of rules, that the contestant is the builder of the model, the flying order, and that if a place on the team is won, the trip to Finland will be taken if the team is sponsored or else announce within one week the inability to go, will be signed during processing. 11. Proxy flying is permitted if the builder can show good reason for not attending in person. Both the builder and the flyer must sign the affidavit which can be obtained in advance from the Contest Director. 12. Contestants may enter any one elimination and, if they qualify for a semi-final, may enter any one of the semi-finals. Entry in more than one elimination or semi-final will disqualify the contestant.

At the *Federation Aeronautique Internationale* meeting last year, it was decided to restrict international championship contests to four in number; one for each main category. The 1951 schedule is as follows: *Wakefield Rubber*, Jami-Jarvi, Finland, July 7 & 8. *Power Duration*, Paris, France, June 16 & 17. There will also be a non-championship radio control event. *Controline*, Knokke, Belgium, July 29. The championship is for all speed classes, but a supporting stunt contest is also scheduled. *Glider*, Jugoslavia, August 15-20. Models must meet Nordic (A/2) specifications (32-34 sq. dm. area, min. weight 410 gr.). There are also supporting power and Wakefield events scheduled.

Clubs. Having now run their first Flying Fair, the Woonsocket, R. I., *Flying Fools* have

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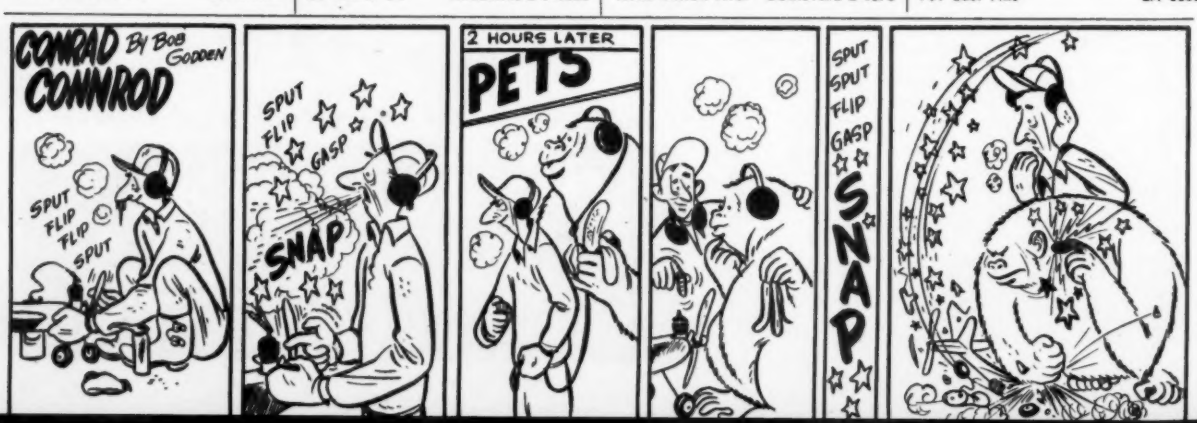

been undertaking an ambitious winter program of training the youth of the Woonsocket area in model aviation. Their first full dress contest has taught them numerous things and foremost is the fact that a high percentage of the spectators have little respect for ground rules. This, combined with other factors, demonstrates how potentially dangerous it is for a meet to be run without insurance protection. Incidentally, $50 was wanted by an insurance company for protection of their one-day meet. All this adds up to one conclusion. If modelers join AMA and contest managements have meets AMA sanctioned and conducted according to the Academy's fly safely regulations, there would be little worry as to the modeler's liability and there would be only a little additional expense involved. Modelers wishing to further model aviation and also join a progressive club in Woonsocket should contact the *Flying Fools* at P. O. Box 1302, Woonsocket, R. I.

Not to be outdone is the *Rubber City Aeronauts* of Akron, Ohio. Since last Novemer, nine schools teaching building and flying have been conducted in the Akron area with the guidance of the RCA and sponsorship of the Plymouth Dealers Assn. of the Akron district. Lloyd Wellner, Contest Chairman of the RCA and director of the schools, announces that they are working toward having the classes continued until the summer contest season begins. The last we heard was that 394 were enrolled in the schools with ages ranging from 6 to 34! If you're in the Akron area and the classes interest you, why don't you get in touch with L. R. Wellner, 2492 Front St., Cuyahoga Falls, Ohio?

Team Racing among the members of the *Bucks County Federation of Model Clubs* (Pa.) is really clicking due mainly to the plugging by Ralph Biddle and Frank Horn. At one of the Federation's meets held a short while back, quite a number of team racing entries were registered and, with excellent supervision, the event was smoothly run. One of the biggest difficulties encountered with team racers is the entanglement of control lines and failure to adhere to a time limit for starting engines. Strictly adhering to a 2 min. time limit, models which were not started in that time were removed from their releasing stooges. The race was then started for the balance of the models while mechanics for the unstarted models remained outside the flight area attempting to start the engines. When started, they were manually released for a late start. No line entanglements were had in the meet!

One California club didn't like the breaks the speed flyers were having over the stunt boys at the Southern California contests in 1948 and 1949. Jerry Gaston of the *Orange County Thunderbugs*, Santa Ana, Calif., tells us that at most of those meets, there were about 24 trophies for 30 to 50 contestants in speed and only about 12 trophies for some 75 to 100 contestants in stunt. So, to help even up the score, the *Orange County Thunderbugs'* Second Annual Meet was all stunt.

Payload Comes to Controline

(*Continued from page* 15)

working out very nicely in the flying wing types, such as shown in figure 2.

Landing gear should be extremely strong, with the widest possile tread in order that maximum ground stability may be provided to get these heavily laden ships off in a minimum of elapsed time. Landing gear fairings are a definite asset when properly designed and constructed, provided of course, that they do not interfere during take-offs and landings.

Control mechanisms in the model should be constructed with the greatest care. With a clear mental picture of the high flight-loads imposed on the bellcrank, lead-outs and other parts of the control system, it becomes obvious that slap-dash construction or faulty design will not only result in a high percentage of crackups but becomes downright

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dangerous from the spectator stand-point. Bellcranks should preferably be of the block type, now used on many of the big speed ships. Lead-out wires of at least twice the diameter of the flight wires will provide sufficient strength. Push rods should be chosen for rigidity under extreme control loads. Metals that do not flex or fatigue readily are best suited for control horns.

We cannot stress the strength feature of this type of model too strongly. With no stretch of the imagination it may be seen how disastrous a crack up of a heavily loaded controline model would be. So, build it light but build it strong!

Before we conclude the design part of this discussion, it might well be noted that a fuel system of ample size and proper design should be given careful consideration. Since models for this event must take off quickly, with a heavy load, fuel systems that permit a lean needle valve setting at take off and maintain this setting throughout the flight seem the most practical.

Last but not least is the finish of your model. Any speed modeler, who knows how to squeeze that last mph out of a ship can verify the value of a fine finish. So, a word to the wise is sufficient—and besides—who can point with justifiable pride to a flying junk heap?

At this point in our discussion, we would like to explain the method of scoring shown in figure 1. As you undoubtedly realize, trying to reconcile a speed in mph with a load in ounces, to provide a satisfactory and accurate score in points can and did provide many hours of head-scratching and fingernail biting. Several methods were suggested, but discarded because they did not provide an accurate picture of the true efficiency of a model for this event, particularly when unusual situations of high loads/low speeds and high speeds/light loads arose. After numerous attempts to overcome these nagging little problems, the graph as shown in figure 1 was evolved.

By locating the speed in mph along the lower edge of a sheet of graph paper with the payload in ounces up the left side and striking a reference line from their point of intersection, a logical and accurate method of scoring that will still provide the speed of computation so necessary to harassed contest officials was the result.

A glance at the graph should reveal the simplicity of operation. With a straight edge of any type, connect the speed in mph with the payload weight in ounces, and draw a straight line connecting these two points and intersecting the reference line at some point. From the point of intersection on the reference line, draw a line at right angles to the line marked in mph. At the point of intersection between the vertical line just drawn and the line mph, read the score, using the speed graduations as the basis for scoring with a multiplying factor of 10. This is clearly illustrated in examples A and B as shown in figure 1. By using this method for scoring, it becomes evident that an enterprising model builder with a hot D job who might enter with the thought of accumulating a winning number of points through speed alone, wouldn't stand a chance, even though he may have complied with the other rules governing this event. If he, for example, recorded a speed of 160 mph without any payload, his score would be 0 points, since a line connecting 160 mph with 0 ounces payload intersects the reference line at the point of origin. The object of this event is to lift a maximum load and attain a maximum speed and by so doing you will accumulate a maximum score with this method.

To those modelers who have been searching for a new and interesting field for their energy, we recommend controline payload flying. The challenges presented by this new event are interesting and exciting. The problems you will encounter in the design of a model for this type of flying, are similar in many respects to the engineering knowledge required in the design of full-size aircraft.

The members of the *Propwashers MAC* and the author are interested in any problems, suggestions for improvement, and news of your experiments.

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